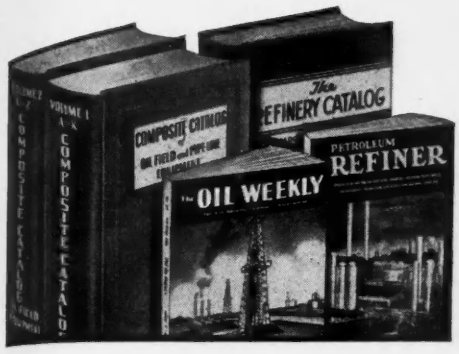

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The OIL WEEKLY and The COMPOSITE CATALOG for the drilling-producing-pipe line industry

PETROLEUM REFINER and The REFINERY CATALOG for the refining-natural gasoline industry

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The OIL WEEKLY

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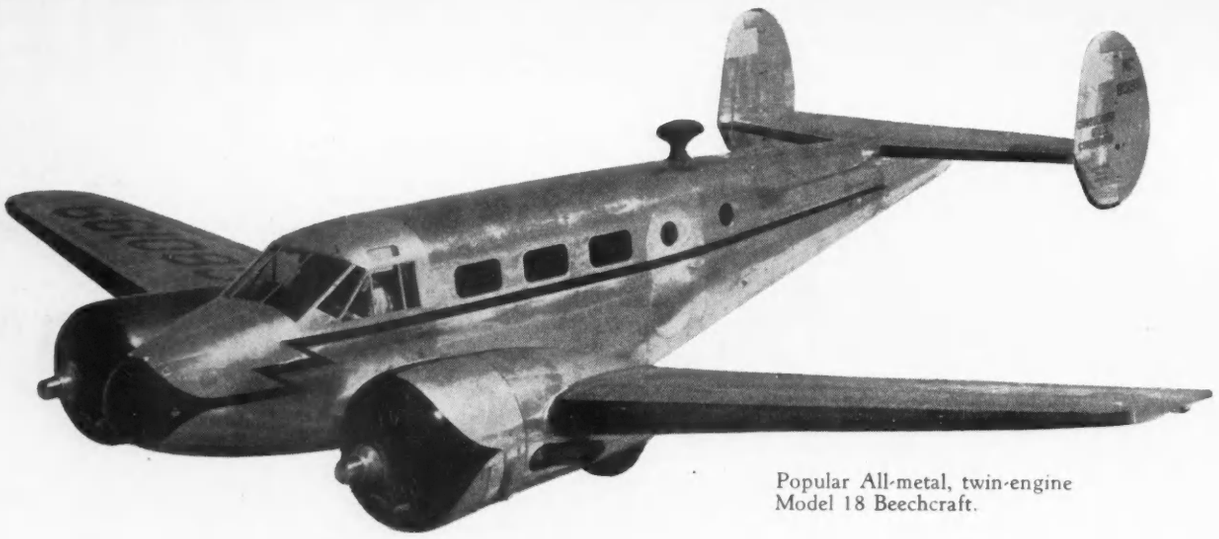

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THE CHANGING Panorama

Current World Oil Exploration at Peak

THE greatest exploratory drilling campaign the world has ever known is now under way. Not only does this apply to the United States, where 4830 wildcat wells were drilled last year and more are under way this year, but it applies all over the globe. In every land where there is a chance of finding oil, either geophysical crews or drilling crews are at work.

Last year Venezuela drilled 440 percent more wildcat wells than were drilled the year before—and more will be drilled this year. Colombia is seeing the heaviest campaign in her history. Only delay in passage of the proposed new oil law in Peru is holding up a widespread search for new oil there; Ecuador continues her search. Bolivia apparently has interested new American capital. Argentina, with a big campaign planned, is flirting with private enterprise again to carry on still additional exploratory work. The long looked for orders from Argentina are due at any time.

Brazil has changed her constitution to allow private enterprise from outside the country to come in. Canada has just seen completed her most successful wildcat in years. And geophysical crews are working throughout the provinces.

It is possible that Roumania may have a breathing spell in the form of a moratorium on the shipment of 60 percent of her oil to Russia as war reparations, which would mean that Roumania would become active again. The Middle East is running full blast, with such a pipe line building campaign on as has never been seen anywhere before. Egypt and French Africa are the scenes of the heaviest wildcat drilling in their history —15 rigs running on exploratory wells in French North Africa alone.

Burma is in process of rehabilitation, the same thing applies to the Dutch East Indies where only the political situation has held back numerous crews from going to work to re-drill wells destroyed by the Japs. New Guinea is about to see a heavy campaign. China is considering a new oil law. Turkey also is thinking of an oil law which will invite foreign capital.

What of the Future?

SINCE rising prices are commonly associated with prosperity and since prices of oils have increased considerably along with prices in general, this may appear to be a time for optimism in the industry. However, it is a time for caution, too, if forecasts of the Bureau of Agriculture Economics prove accurate.

The economists of this agency foresee for the latter half of 1947 a decline of 5 to 10 percent in industrial production from the peak in the first half of the year. They foresee lower income payments to individuals, topheavy business inventories, flattening out or decline in plant construction and equipment purchases, shrinkage in savings accounts and rate of savings, and decline in wholesale food and farm prices. The most important reason cited is a steady decline in consumer purchasing power. This may be partly offset by increased installment buying of consumers, but there has already been considerable extension of credit.

There is large pent-up demand for automobiles, housing, and other durable goods, the agency conceded, but these needs cannot be translated into purchases if high prices wipe out savings, further reduce real income, and use up ready been considerable credit extension.

* * *

In Europe a man who starts fairly low in a business organization and ends up as a chief executive is looked upon with surprise. In this country such a career occasions little comment because it is the pattern—not the exception.

—R. T. HASLAM, Vice President,
Standard Oil Company (New Jersey)

Taxation Methods Promote "Monopoly"

TWO important factors, increased capital requirements and a discouraging tax situation, are tending to reduce participation in oil industry development by individuals and smaller companies. This view is held by Sidney A. Swensrud, executive vice president of Standard Oil Company (Ohio), who deprecates the effect of high inheritance, estate, and income taxes, which he said tend to force independents to sell out properties and refrain from undertaking new ventures. On the one hand, he asserted, the government thus promotes gravitation of oil industry properties into fewer hands, while on the other hand the government professes concern over trends toward monopoly—trends which it actually promotes through taxation.

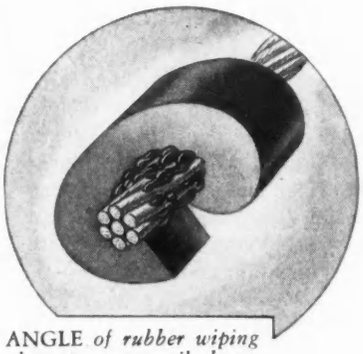
Difficulties of operating in the modern petroleum industry, with its deep drilling, expensive technical aspects, and extensive government-required paper work, are formidable, even when the tax situation is not considered, Swensrud explains. But even more forbidding are the income, estate, and inheritance taxes, as they often make it more attractive for an operator to sell out than to operate for profits that are largely taxed away.

The purchasers, usually refiners, would prefer to see independents stay in production, stated Swensrud, because the latter help to supply necessary capital, enterprise, and initiative in providing supply, also affording flexibility for refiners in obtaining supply. But when the independent producer decides to sell out, refiners are virtually forced to bid against each other for his properties, in order to hold well connections involved or to try to get them in replacement of connections sold by another independent to another refiner; one refiner's purchase of a producing property thus forcing other similar purchases.

To Squee-gee Oil off a Corkscrew

or...why Patterson-Ballagh's spiral wiping principle wipes wire lines clean and dry

Wire lines are like a corkscrew. Their surface is a complex pattern of twisty grooves and channels where oil, mud or salt water collects and flows into droplets. When carried aloft on the line, the droplets blow off or shake free to shower down on the crew and rig, resulting in fire and accident risk from oil or in salt water corrosion plus a loss of many dollars in clean up costs in any case.



ANGLE *of rubber wiping element moves oil downward* along *spiral channels and collects the excess.*

Patterson-Ballagh Wire Line Wipers use a principle of design which thoroughly cleans the wire line, returns the oil to the hole and keeps the premises oil-free. Their rubber wiping element is molded in a helical form. This causes the squee-gee to fit into and follow the oil *along* the corkscrewed grooves between the strands. The elastic rubber conforms to the regular lay of the wire, cleans out all the oil bearing channels and flows the excess out at the bottom of the wiping element.

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THE WEEK'S NEWS

A SENATE Small Business Committee investigation of the pipe situation appears likely as a result of interest displayed by members in the study made by the OGD interdepartmental committee, which showed that pipe mills currently are producing at only 75 percent of capacity because of lack of plate and would require three years to catch up with requirements for currently building and projected pipe lines. Story below.

Arabian Oil Study—The Senate War Investigating Committee is seeking to examine any of the late President Roosevelt's personal papers at Hyde Park which may have a bearing on its investigation of Arabian American Oil Company. Page 34.

Natural Gas Act Hearing—The House Interstate and Foreign Commerce Committee opens hearings today on revision of the Natural Gas Act with a score of industry witnesses waiting to testify. Page 33.

Labor Legislation—Congress is preparing to take definite action on labor legislation banning the closed shop, jurisdictional strikes, nation-wide bargaining and union abuses.

German Industries Study—A group of leading businessmen, including A. C. Mattei, president of Honolulu Oil Corporation, is to go to Germany for the War Department to study industrial and export problems in the American-British zones. Page 37.

Second Quarter Demand—The IPAA supply and demand committee estimates minimum required domestic production this quarter at 4,790,000 barrels daily, with imports near 500,000 barrels daily, to meet consumptive demand of 5,550,000 barrels and additions of 80,000 barrels to refined inventories. Bureau ups 1947 estimate. Page 33.

Porter Re-elected—H. J. Porter was re-elected president of the Texas Independent Producers and Royalty Owners Association at the first annual meeting held last week in Dallas. Page 34.

O'Mahoney Before IPAA—Senator J. C. O'Mahoney of Wyoming will address the midyear directors meeting of the Independent Petroleum Association of America in Jackson, Miss., May 8-9 on "Elements of a Sound National Oil and Gas Policy."

World's Deepest Well—Fifteen hundred feet of drill pipe remains in the world's deepest hole in Caddo County, Oklahoma, after a cutting job. Fishing will follow immediately. Page 34.

Nomads Name Officers—Two Houston men were selected as heads of the National Board of Regents of Nomads. Page 33.

Flare Gas Report—Progress is being made on eliminating casinghead gas flares in Texas fields, the Railroad Commission is told. Page 32.

Would Give Interior Task Of Leasing Acquired Lands

Legislation placing "acquired lands" in the hands of the Interior Department for leasing for the production of oil, gas and certain other mineral resources has been introduced in Congress by Senator E. V. Robertson of Wyoming to eliminate the confusion which now prevails because of the scattering of jurisdiction over such lands among a number of federal agencies.

The lands covered by the bill comprise some 150,000,000 acres obtained by the government by purchase, gifts or condemnation under acts of Congress.

In the past, Robertson pointed out, some of these lands have been leased for oil and gas development, but a lack of statutory authority to lease and the absence of a uniform policy in leasing procedure has retarded their development.

The bill is in line with a recommendation by the Secretary of the Interior for the concentration of all leasing activities on his department, and has been approved by various oil and gas associations and companies.

Drilling Contractors Select Long Beach as Meeting Site

Directors of the American Association of Oil Well Drilling Contractors have selected Long Beach, Calif., for the next annual meeting, October 13-15. The selection was made in Tulsa April 8.

Twenty-five Tulsa contractors participated in an open forum discussion covering research, mud schools, accounting, safety and insurance at the Tulsa meeting. Next directors' meeting will be in Shreveport July 15.

Congress to Look Into Matter of Pipe Shortage; Inter-Agency Group Reports

A congressional investigation of the steel situation may serve to bring out information regarding pipe shortages which are affecting production operations and pipe line construction, but the big question, what the government can do about it, still remains to be answered.

Senator Kenneth S. Wherry of Nebraska, chairman of the Senate Small Business Committee, set up the special investigation sub-committee comprising Senators Edward Martin of Pennsylvania, Harry P. Cain of Washington, Irving M. Ives of New York, Allen J. Ellender of Louisiana and Spessard L. Holland of Florida.

The group is to probe the problems of smaller users of steel, manufacturers and fabricators, and is expected to get into the field of casing and line pipe as well as other oil-gas industry items.

Indications that the subcommittee might dig into the oil pipe situation were seen in the interest displayed by Senator James E. Murray of Montana, ranking minority member of the Small Business Committee, in the study being made by the OGD interdepartmental committee. This group last week discussed its findings on the basis of potential requirements for 16-inch and larger pipe.

Steel and oil industry sources revealed that as of March 15, pipe requirements totaled approximately 3.7 million tons. However, these requirements included both lines to be put actively under construction and projects still in the blueprint stage.

Capacity of mills producing pipe from 16 to 30 inches in diameter is about 1.2 million tons a year, but actual output probably is running in the neighborhood of 900,000 tons, largely because of lack of steel plate.

The figures showed that if the mills worked at capacity it would take about three years to clean up present requirements; that on a first-come-first-served basis, orders for large diameter pipe placed today would not be reached until sometime in 1950. Lack of adequate plate supplies is a major factor in keeping operations at about 75 percent of capacity.

The committee will continue its study, and it may have a report ready for the forthcoming National Petroleum Council meet. The council likely will be requested to reconstitute the materials committee to go further into the question of casing and line pipe.

The situation with respect to 12-inch line pipe is less serious than that in the larger sizes, although here, too, a better supply is to be desired.

Pioneers to Meet

California's Petroleum Production Pioneers will sponsor a barbecue and general roundup of Valley pioneers at the Kern Country Golf Club, north of Bakersfield, California, Saturday, May 3. In charge of arrangements will be Ox Morgan, Larry Coker and Lou Bronzan. J. E. Gosline is president of the Pioneers.

OGD Appropriation Likely To Suffer from Economy Ax

There were some indications in Washington last week that congressional appropriations for the Oil and Gas Division of the Department of the Interior might be denied or cut to the extent that contemplated operations would be impossible. The House commitee report is expected late this week.

An item providing for synthetic liquid fuels research by the Bureau of Mines, and a secondary recovery study appropriation of $300,000, also are said to be down for paring. Nearly half a million dollars was asked by the President for OGD. That appropriation, too, seemingly has drawn fire in the economy-minded subcommittee which has been considering the items.

Texas Commission Receives Flare Gas Progress Report

Operators reported substantial progress as the Texas Railroad Commission last week held hearings to show why oil fields should not be closed in unless gas flares are eliminated. Reports included:

Heyser field, Calhoun County — Field operators will buy and enlarge Humble Oil & Refining Company stripping plant, are seeking line contract for sale of residue.

Tom O'Connor field, Refugio County —Operators have contracts for sale of gas to a processing plant which should be in operation next fall. Line contract has been made for residue.

West Ranch field, Jackson County, processing plant of Magnolia Petroleum Company to open June 3 will have capacity of 23-25 million cubic feet with 40,000-barrel daily liquid recovery. Magnolia will buy all unwanted residue.

Anahuac field, Chambers County processing plant of Humble will be ready by August and that company can take all residue.

Conroe field reported 861 out of 887 oil wells connected to Midland Gasoline Company and Humble plants, with February flared gas amounting to 24 million cubic feet daily or 52 percent. Eventually no gas will be flared.

Webster field, Harris County—Humble, which operates 203 of 206 wells, put a gasoline plant and compressor station into operation in March and processes all its casinghead gas. Residue goes into its Tomball gas system.

North Withers and Magnet Withers fields, Wharton County—No facilities or plans for handling casinghead gas, nearly 11 million cubic feet flared daily.

Agua Dulce field, Nueces County—Numerous plants now operating but operators see no feasible means of economically utilizing casinghead gas now vented in isolated producing areas.

THE OIL MAN'S CALENDAR

APRIL 16–18	Southern Gas Association, Biloxi, Miss.
16–18	Eastern District, API Division of Production, Spring Meeting, Pittsburgh, William Penn Hotel.
16–18	National Petroleum Association, Semi-Annual Meeting, Cleveland, Ohio, Hotel Cleveland.
22	National Petroleum Council, Washington, D. C.
23–25	Natural Gasoline Association of America, Annual Convention, Dallas, Baker Hotel.
24–26	Interstate Oil Compact Commission, Quarterly Meet, Birmingham, Ala. Tutwiler Hotel.
30-May 1 & 2	American Gas Association, Natural Gas Division, Spring Meeting, Chicago, Stevens Hotel.
MAY 4– 7	Annual Membership Meeting, Petroleum Equipment Suppliers Association, San Francisco, Mark Hopkins Hotel.
6– 8	Petroleum Industry Electrical Association and Petroleum Electrical Supply Association, Joint Convention, Houston, Rice Hotel.
6– 8	Annual Gas Measurement Short Course, Norman, Oklahoma.
8– 9	Mid-Year Meeting of Directors, Independent Petroleum Association of America, Jackson, Miss.
15–16	Pacific Coast District, API Division of Production, Spring Meeting, Los Angeles, Biltmore Hotel.
15–17	National Oil Scouts and Landmen's Association Annual Meeting, Roosevelt Hotel, New Orleans.
21–24	ASME Oil and Gas Power Division, Cleveland, Ohio.
22–23	Mid-Continent District, API Division of Production, Spring Meeting, Amarillo, Texas, Herring Hotel.
27–30	Texas A. & I. College, Second Annual Course in Gas Technology. Kingsville.
JUNE 5– 6	Pennsylvania Grade Crude Oil Association Annual Meeting, Pittsburgh, William Penn Hotel.
16–19	ASME Semi-Annual Meet, Chicago, Stevens Hotel.

Nomads Chapter monthly meetings: LOS ANGELES, second Wednesday, Mayfair Hotel. HOUSTON, second Monday, Ye Olde College Inn. NEW YORK, first Monday, Louis Sherry's. TULSA, third Wednesday, Hotel Tulsa. DALLAS, date not yet fixed.

Kansas Asks Forfeiture Of Big Co-Op's Charter

Kansas' biggest cooperative, the Consumers Cooperative Association, dealer in petroleum and petroleum products, is facing a Supreme Court suit seeking its dissolution.

Edward F. Arn, attorney general, filed the quo warranto action against the Cooperative April 8, charging that the Co-Op had sold more than $7 million in unregistered securities through February of this year, in violation of the law.

Arn asked that the Co-Op "be dissolved, its charter be forfeited, its corporate existence as a marketing association be annulled and that the court name a receiver."

The Consumers Cooperative Association was chartered with an authorized capital of $2 million. It has sought, unsuccessfully, to increase its capital to $12 million.

New French Gas Line Is Put Into Operation

The new 37-mile natural gas pipe line between Tarbes and Pau in southwest France, an extension of the Saint-Marcet-Tarbes pipe line, which connects Tarbes with the zone of natural gas south of St. Gaudens, has been placed in service. A further line is planned to connect Tarbes with Pierrefitte-Nestalas, 25 miles to the southwest.

Total French natural gas output during December was 365,920,000 cubic feet, and during that month about 29,000 barrels of crude oil was produced from the French oil fields.

1947 Officers, New York Nomads

Officers of New York Chapter of Nomads for 1947 are shown above, left to right, as follows: Seated—Val R. Wittich, export representative, regent; A. V. Simonson, export representative, president; James W. Reed, Cooper-Bessemer Company, regent. Standing—J. B. Roberts, Chain Belt Company, assistant treasurer; Park B. Turner, Jones & Laughlin Steel Company, treasurer; N. L. Boulden, International General Electric Company, secretary; James G. Burnett, Heat Transfer Products, Inc., assistant sergeant-at-arms; Myran J. Livingston, Arthur J. McKee, sergeant-at-arms. Not included in the picture are E. M. Gretzler, National Supply Company, vice president; and George P. Kenny, Thomas C. Wilson, Incorporated, assistant secretary.

Nomad Heads

C. W. Thornhill

Floyd L. Senter

Charles W. Thornhill of Thornhill-Craver Company, and Floyd L. Senter of National Tank Company, have been named president and secretary-treasurer, respectively, of the National Board of Regents of Nomads for the ensuing year.

Both new officers are charter members of the Houston Chapter.

Natural Gas Act Changes Before House Committee

The House Interstate and Foreign Commerce Committee settled down today for a full week of hearings on legislation amending the Natural Gas Act.

Major points of the testimony include the FPC's efforts to regulate the end-use of natural gas, its methods of dealing with expenses and revenues of operations not subject to its jurisdiction in fixing rate bases, and use of acquisition costs rather than current value and the compensation allowed natural gas companies for gas produced from their own wells or purchased from affiliates or subsidiaries.

Another point, on which the commission has apparently retreated but which the industry urges be written specifically into the law, is exemption of production and gathering activities from FPC control. A recent staff report of the commission held it had no jurisdiction in this field.

The industry presentation will be made by some 18 or 20 witnesses. The hearing will be confined to one week.

The oil and gas industry has expressed its opposition to the suggestion that FPC clarify the Natural Gas Act through administrative instead of legislative action. The commission had asked for comment and IPAA, Mid-Continent Oil and Gas Association, Texas Governor's Committee, and Independent Natural Gas Association are included in the groups that have entered views counter to those contained in the recent FPC staff report.

Point to Advisability of Natural Gas Act Changes

Rex Baker, chief counsel, and Nelson Jones, attorney, for Humble Oil & Refining Company, before the Texas Railroad Commission last week charged that recent indications are that FPC has embarked on a program to control the field price of casinghead gas.

They asserted that unless the Natural Gas Act is amended to protect the producer and gatherer of gas, companies cannot afford to sell gas to interstate transmission companies. FPC's threat of control has deterred gas conservation in fields where the only practical disposal of residue gas is to a natural gas company, they alleged.

Meanwhile, the Texas Senate unanimously approved a resolution asking the Texas delegation in Congress to support Natural Gas Act amendments and thus prevent FPC encroachment on the state's regulation of gas production.

Oil Show and Reunion

An oil men's reunion will be held in connection with the oil industry's participation in the Port-O-Trade National Manufacturers Exposition, June 13-22, at Long Beach, California. A large area has been set aside for exhibits of oil drilling and production equipment.

W. R. Martin, former president of Martin-Decker Corporation, head of the Long Beach Harbor Commission, will be host to the oil men.

Crude Oil Production in the United States

(Estimates compiled by THE OIL WEEKLY. All figures indicate daily averages in barrels.)

STATE OR DISTRICT	PRODUCTION IN WEEK ENDED April 12	April 5
Alabama	1,200	1,000
Arkansas	73,800	74,000
California	909,600	907,100
Colorado	36,750	38,000
Florida	575	600
Illinois	186,100	184,110
Indiana	18,250	18,000
Kansas	269,800	276,450
Kentucky	27,300	27,500
Louisiana	407,610	407,610
North Louisiana	95,000	95,000
South Louisiana	312,610	312,610
Michigan	43,000	43,500
Mississippi	88,750	88,000
Missouri	100	100
Montana	22,000	22,100
Nebraska	600	650
New Mexico	103,650	103,650
New York	13,000	12,900
Ohio	8,850	8,800
Oklahoma	378,900	379,250
Pennsylvania	34,150	34,100
Tennessee	25	25
Texas	2,150,550	2,150,550
Tex. R. R. Comm. Districts:		
Dist. 1—South Central	20,665	20,665
Dist. 2—Middle Gulf Coast	157,960	157,960
Dist. 3—Upper Gulf Coast	483,440	483,440
Dist. 4—Lower Gulf-S.W.	241,970	241,970
Dist. 5—East Central	38,150	38,150
Dist. 6—East Texas field	325,570	325,570
Dist. 6—Rest of Northeast	111,285	111,285
Dist. 7-B—North Central	36,770	36,770
Dist. 7-C—West Central	35,700	35,700
Dist. 8—West	480,710	480,710
Dist. 9—North	133,540	133,540
Dist. 10—Panhandle	84,790	84,790
West Virginia	7,600	7,000
Wyoming	109,500	110,750
Total United States	4,891,660	4,895,745

Total stocks, foreign and domestic, April 5, as reported by the Bureau of Mines were 230,401,000 barrels.

Bureau Again Increases Its Estimate for 1947 Demand

The Bureau of Mines last week raised its forecast of total demand for 1947 by 2 percent over its December figure, estimating now that it will reach 2063 million barrels, a 6 percent increase over last year.

The bureau's new long-range report forecast that this year's demand would call for 822 million barrels of motor fuel, 505 million of residual fuel, 310 million of distillate fuel, 110 million of kerosene and 316 million of other products.

A daily average production of 4,838,000 barrels of crude and 354,000 barrels of other oils will be required to meet demand if imports continue at their first-quarter level of 460,000 barrels daily, the bureau said.

For the current month, the bureau forecast demand for 4,850,000 barrels of domestic crude daily, as compared with an estimate of 4,745,000 barrels for March and in actual demand in April, 1946, for 4,641,600 barrels.

To achieve the increase over last month, it raised the forecasts for Texas from 2,060,000 to 2,120,000 barrels; California, 850,000 to 860,000 barrels; Louisiana, 400,000 to 410,000; Oklahoma, 375,000 to 380,000; Kansas, 270,000 to 275,000; Wyoming, 100,000 to 106,000; New Mexico, 101,000 to 102,000; Mississippi, 77,000 to 84,000, and Pennsylvania, 35,000 to 36,000 barrels. Rates for other states were left unchanged.

IPAA Sees Second Quarter Demand Gaining 5 Percent

A total new supply of 5,630,000 barrels petroleum daily during the current quarter will be required to meet increasing consumptive demand and the need for stock replenishment, the supply and demand committee of the Independent Petroleum Association of America has told the Interstate Oil Compact Commission.

First quarter's over-all demand was 10 percent higher than in the first three months of 1946 with individual increases of 15 percent in kerosine, 25 percent in light fuel oils and 8 percent, each, in gasoline and heavy fuels and the committee anticipates that second quarter demand will run 5 percent above last year.

Consumptive demand for all oils during the present quarter was estimated at 5,550,000 barrels daily and, with no change in crude stocks, 80,000 barrels daily will be required for seasonal additions to inventories of refined products.

With a continuation of the present high import rate—close to 500,000 barrels daily, and an estimated output of about 340,000 barrels of natural gasoline and allied products, the committee calculated a production of 4,790,000 barrels daily of domestic crude would be required. Actual production this month is expected to average close to 4,900,000 barrels daily, and if that rate is maintained during May and June a substantial reduction in imports will be required to bring total supply in balance with demand.

Texas Independent Oil Group Approves Aggressive Program; Porter Re-Named

By SILAS B. RAGSDALE,
Managing Editor

A second-year budget which just about doubles that of the first year when 1200 members were enrolled, was adopted by the Texas Independent Producers and Royalty Owners Assocation in its first annual convention at Dallas last week. H. J. Porter of Houston, re-elected president asked for aggressive interest in enlarging the association's influence. The full-time staff, besides E. I. Thompson of Houston, re-elected executive vice president, will include a field man to stress memberships and a public relations man to edit a monthly paper, etc.

H. J. Porter

The association adopted resolutions *opposing:* 1) the proposed "De Novo Bill" in the state legislature; 2) the proposed Texas unitization statute; 3) export of tubular goods in view of the existing dangerous shortages; 4) enlargement of the scope and powers of the Federal Power Commission through amendment of the national Natural Gas Act as proposed by Risley and Moore; 5) ratification of the Anglo American oil treaty; and 6) any appropriation for the Oil and Gas Division of the Department of the Interior.

Action was taken *advocating:* 1) Increase of railroad commissioners' salary from $7000 to $10,000 each; add 10 more engineers to commission's staff; staff of a minimum of five statisticians in the commission offices which should be combined and located in the Tribune building at Austin; 2) federal agencies to lease or sell fee land they now control at terms established in the public land leasing statute, and permitting no retention of mineral rights by the federal government when such transactions are effected; 3) legislation that would cause insurance companies to divest themselves of any mineral rights on properties acquired through foreclosure and then sold; 4) House Bill 111 which permits partition of community estates by husband and wife; 5) investigation as to allocation of current steel output.

Opposed to NPC

President Porter, a member of the National Petroleum Council, asked for a resolution seeking dissolution of this body, but after discussion the matter was tabled. Porter thought the council was shaping the machine that would ultimately take over the oil and gas business if the oil pact ever is ratified, declared the NPC bodes no good for the independent producer.

Porter's annual report called for cooperation with the Railroad Commission "in its policy of setting allowables for Texas production continuously at a point to meet consumptive demand" and asked for legislation requiring purchasers of natural gas to evaluate the gas by taking into consideration the deviation from Boyles law. Such provisions are in contracts for purchase of gas from big producers and Porter thought the small producer and royalty owner entitled to the same terms. He insisted that "Texas demand its fair share of the crude oil market of the U. S."

Other officers elected included (asterisk indicates new man for the post): C. S. McCaleb*, San Antonio, treasurer; John I. Moore*, Midland, secretary; vice presidents and executive committeemen—Walter Henshaw, San Antonio; C. K. McCan, Victoria; Ralph A. Johnston*, Houston; Guy Warren, Corpus Christi; Arch Rowan, Fort Worth; R. L. Foree*, Dallas; W. C. Windsor* and Bryan Payne, Tyler; J. C. Hunter, Jr.*, Abilene; Dwight L. Hunter*, San Angelo; C. V. Lyman, Midland; Edward G. Kadane, Wichita Falls and A. E. Herrmann, Amarillo. Forty-three new directors also were named.

At the annual banquet, Chairman E. O. Thompson of the Railroad Commission urged the independents "to stay independent," praised their fight against the De Novo bill and declared that conservation of casinghead gas was the commission's current No. 1 objective.

Dr. Waldo E. Stephens of Oklahoma City, vice president of Stephens Oil Company and formerly on the economics staff at Columbia University, spoke on "Our New Instrument of Foreign Policy," saying this was financial aid extended by the U. S. to foreign countries. Apart from war costs, he said that some $66 billion had been drained off from our national economy since World War I by war debts, purchase of worthless foreign securities, exchange of our goods for high-priced gold and lend-lease. Each of these financial adventures "contributed to the temporary prosperity of the people of the U. S.," he said. Since World War II "we have loaned or taken commitments abroad to the extent of another $20 billion with the end not yet in sight.

"Our nation has finally arrived at the point where world disorder threatens our security and prosperity," he continued. . . . "The implications and costs of the 'Truman Doctrine' cannot be foreseen. Safeguarding of world peace and the reconstruction of war-torn lands calls for greatest stability of our domestic economic operations. . . . A serious depression in the U. S. would open the way for the advance of revolutionary forces in strategic areas of the world. . . . Prospects for continued high domestic employment and heavy exports are not bright. Costs and prices must be reduced so that units of production can be offered in the domestic and foreign market at rates that increasing millions of consumers can afford to pay. . . .

"The defeat of Greece and Turkey in an uneven contest with Soviet Russia would mean the ultimate shift of Palestine, Iran, Iraq and perhaps Egypt to Russian guidance. This could produce conditions far more conducive to warmaking on the part of the great powers than the financial aid proposed for Greek and Turkish rehabilitation.

"The road ahead is uncertain, the contest is intense and the cost to the U. S. is high. We cannot turn back. We must face our world assignment with courage, realism and a sense of responsibility."

Arabian Oil Hearing Awaits Group's Return

An examination of all of the late President Roosevelt's personal papers at Hyde Park which may have any bearing on the wartime relationship between the United States and Saudi Arabia and the operations of the Arabian American Oil Company is planned by the Senate War Investigating Committee.

A request which the committee made to President Truman for photostatic copies of three specific documents, includes a letter written President Roosevelt in 1941 by James A. Moffett, former chairman of the boards of Bahrein Oil Company and California-Texas Oil Company, Ltd.

Chairman Owen Brewster of Maine and other members of the committee now attending an international meeting in Cairo plan to fly to Saudi Arabia for a survey of Arabian American's operations there, while in Washington former Senator Burton K. Wheeler of Montana is preparing a report on the Navy's purchases from the company. Further hearings await the committee's return.

Deep Test Washing Drill Pipe Left After Recovery

Crews continue washing more than 1500 feet of drill pipe remaining in the hole at Superior Oil Company of California's Weller 51-11, NW NW NE 11-8n-12w, near Fort Cobb in Caddo County, Oklahoma. All but 1500 feet of drill pipe was recovered after crews successfully cut pipe at approximately 15,736 feet.

An attempt to recover the fish will be made following washing and if this fails, operators will set whipstock and bypass remaining pipe.

The drill pipe became stuck on March 15, 25 feet off bottom. Total depth is 17,236 feet, a world's record.

Picture Tour Presented

A picture tour of the petroleum industry is being sponsored by Sun Oil Company at the Franklin Institute. Based on the theme, "Petroleum Promotes Progress," the exhibit tells the story of research in the petroleum industry and what it means in making finer and more diversified petroleum products available to the public.

Secondary Recovery Meet May 15 to Be Open Forum

The joint OGD-Compact Commission meeting for the open forum discussion of secondary recovery has been set for May 15 in Washington, and invitations have been sent to 100 committees and organizations, the state regulatory bodies, individuals, and engineering and operating committees. OGD Director Max W. Ball will preside.

"A review will be made of the areas of interest and activity of each group, as a basis for discussing and determining the best method of integrating their efforts and of continuing the availability of industry advice and consultation in relation to this important problem," it was explained.

Dr. Gauger Will Deliver Priestley Lecture Series

Dr. Alfred W. Gauger, professor of fuel technology and director of the Mineral Industries Experiment Station at The Pennsylvania State College, will deliver the twenty-first annual Priestley Lecture Series at the college, April 21-25. His subject will be "Physical Chemistry and the Technology of Fuels." In his lectures he will discuss "Fuel Technology and the Properties of Fuels," "Interconversion of Solid, Liquid and Gaseous Fuels," "Gasification of Solid and Liquid Fuels," "Physical Chemistry of Combustion," "Fuels as Chemical Raw Materials; The Nuclear Power Plant."

Printed copies of the lectures in expanded form, $2 per copy, may be had from Ray Dickinson, Department of Chemistry, The Pennsylvania State College, State College, Pa.

Gas Price Act Veto

Governor Frank Carlson of Kansas on April 8 vetoed a bill empowering the State Corporation Commission to fix the price and regulate the pressure of natural gas at the well head.

The governor, who said it was possible the commission already had the authority to increase gas prices, gave as the reason for his veto an amendment to the measure which exempts existing contracts.

Texas Statewide

The Texas Railroad Commission will hold its statewide proration hearing to set May allowables on April 18 at the Plaza Hotel in San Antonio. Operators likely will evidence general satisfaction with the record Texas allowable of 2,338,102 barrels daily permitted during April.

Safety Film Made

General Petroleum Corporation, in cooperation with the Los Angeles Police Department, has completed a graphic new safe-driving and traffic-education film, "That They May Live," which will be available without cost to schools, service clubs, etc.

NACE Discuss Corrosion Problems In Symposiums at Annual Conference

By ELTON STERRETT,
Engineering Editor

MORE than 652 engineers, representing those industries suffering most heavily from corrosion losses, last week attended the third annual Corrosion Conference of the National Association of Corrosion Engineers in Chicago. Thirty-four papers, dealing with practical and theoretical phases of the common problem, were presented in the eight symposiums on the technical program. In every instance floor discussion added to the data obtained by the authors, and evidenced the widespread work on the subjects presented.

At the annual banquet of the organization Edwin Vennard, Middle West Utilities Company, Chicago, addressed the members and guests on the subject "An Engineering Approach to the Problems of Freedom." Retiring President F. J. McElhatton introduced the new officers: G. R. Olson, United Gas Pipe Line Company, Shreveport, La., incoming president of NACE; F. L. LaQue, International Nickel Company, New York, the new vice president; O. C. Mudd, Shell Pipe Line Corporation, Houston, re-elected treasurer; the new directors: Dr. Mars G. Fontana, The Ohio State University, Columbus, Ohio; Tom L. Holcombe, Dearborn Chemical Company, Shreveport, La.; and H. H. Anderson, Shell Pipe Line Corporation, Houston. Arthur Smith, Jr., Dow Chemical Company, Midland, Mich., becomes director to fill out the unexpired term of LaQue, newly elected vice president.

The 1948 annual meeting will be in St. Louis, with headquarters in the Jefferson Hotel, the dates selected being April 5 through 8.

Digests of a number of the papers follow:

Gas Utility Underground Pipeline Mitigation Practices

By A. H. CRAMER and W. R. FRASER, Michigan Consolidated Gas Company, Detroit, Mich.

Basing their discussion on practices of their own and other companies in the Detroit area, the make-up of a committee on electrolysis surveys was outlined, so as to insure contact with all companies and individuals interested or involved.

To minimize stray currents, and to prevent drainage through long lines, the lines of the company are broken into units of 400 feet by insulated couplings in areas where many stray currents can be expected, the spacing being increased to 2000 feet between insulated couplings as conditions improve. At each coupling, test leads are installed to facilitate checking of the sections. The line is surveyed each year for four factors: pipe-to-soil potential; pipe-to-soil resistance; efficiency of insulating couplings; and current in wrapped and coated mains. So far, only one current flow has been found.

In a survey of their own and contiguous lines with a new type of line leakage detector, the authors reported that 577 faults were located in 300 miles of line covered. Of this number, approximately 60 percent of the indicated faults were uncovered, and the type of leak determined. The accuracy of the test method was established within close limits, and the efficacy of such tests proven as a means for current leakage determination.

Prevention of Ferric Ion Corrosion During Acid Cleaning

By J. L. WASCO, H. A. ROBINSON and F. N. ALQUIST, Dow Chemical Company, Midland, Mich.

Problems introduced in the acid cleaning of boilers, heat exchangers and other similar equipment were outlined and figures cited to show that the amount of iron removed as oxides during a periodic cleaning reached as high as 1190 pounds in one instance, representing a serious diminution of the effective metal in the structure.

New solvents for use in cleaning under temperatures up to the boiling point were discussed, and the development of a reaction wherein the high metal loss was laid to ferric ion conversion at a much greater rate than occurred with the normal working process of the unit. Usual corrosion inhibitors used with the acid for removing scale were no help in combatting the ferric ion reaction, and that special provisions were required to eliminate excessive loss during the clean-process. Various types and concentrations of additives to reduce the ferric ion loss were discussed.

Silicates for Corrosion Inhibition In The Oil Industry

By WM. STERICKER, Philadelphia Quartz Company, Philadelphia.

Soluble silicates may be used at various stages throughout the industry for protection of steel equipment handling petroleum products with water, or for brine lines without oil. Sodium compounds only were discussed, on account of their cheapness, ease of handling and wide availability.

Applications of 40 parts per million

Edmond Rules Modified

The Oklahoma Corporation Commission has granted the application of Conservation Officer Walker T. Pound to modify West Edmond Hunton field rules reducing the waste of gas, by signing an order limiting gas-oil ratio at 4000 cubic feet of gas per barrel of oil. Since the present ratio is approximately 7200 cubic feet and the new ratio, if based on recent gas-oil ratio tests, would have climbed to around 8500 cubic feet per barrel, the drastic cutback is estimated by conservation officials to be the answer to most problems of gas waste in the big four-county field.

will give 80 percent protection. This is approximately 4 gallons of silicate solution per thousand barrels of brine for protection of a salt-water disposal line.

The silicates are found to form a buff-colored film over existing corrosion, to aid in flushing away loose material, and to build up a coating which is effective in halting or greatly retarding corrosion attack.

One line, treated with sodium silicate, showed the brine clear after 30 months operation, whereas the brine formerly was turbid; pipe scale was reduced and harder, and leakage halved from former totals.

Silicates are also useful in preventing the pick-up of iron by the brine, thus protecting the face of the formation in input wells of salt-water disposal systems. Improvement in one sucker rod string after feeding of silicates to the well through the annulus showed corrosion loss to be one-tenth that formerly experienced, with tubing failures reduced 50 percent.

Effect of Carbide Structure on Corrosion Resistance of Steel

By R. W. MANUEL, Phillips Petroleum Company, Bartlesville, Okla.

Intensive microscopic study of corrosion phenomena in tubing under high magnifications is found to offer a possible indication of the reason for the type of corrosion usually referred to as "ringworm," in which the affected area simulates that on a person with the disease so named. Ringworm attack in tubing is laid to the lack of pearlitic structure at the area destroyed. This corrosion is usually found in the zone where the carbide structure of the steel lacks uniformity due to the effects of upsetting or forming the ends. The attack is in the area where the pearlite is partially destroyed by recrystallization after heating or cold-working.

The occurrence of ringworm corrosion is based on the removal of what otherwise might be a protective film of oxide by scrubbing or scraping action of the sucker-rod joint, in which situation the fresh metal thus exposed undergoes rapid corrosion and eventually the string is weakened to the point where failure occurs.

Under magnifications up to two thousand diameters, the effectiveness of the pearlitic grains in resisting corrosion is clearly seen, even though the surrounding matrix of metal may have been completely removed by the corrosive processes.

Hardness tests identify the pearlitic zones, and enable the softer areas to be discarded as more highly susceptible to corrosion and therefore as zones of potential failure.

Arsenic as a Corrosion Inhibitor In Sulfuric Acid

By A. WACHTER, R. S. TRESEDER and M. K. WEBER, Shell Development Company, Emeryville, Calif.

Though arsenic has long been recognized as a means for protecting metal exposed to sulfuric acid, especially in the higher temperatures, the literature has not covered the behavior of such inhibition under varying acid concentrations nor amounts of arsenic present. Deposition of arsenic as a metallic film is, presumptively, the means whereby protection is afforded. For stronger concentrations, the use of an inhibitor rather than the employ of alloy metals, offers marked reduction in cost with comparable results. Corrosion is said to be a function of acid concentration.

The addition of arsenic in proper proportion was found experimentally to reduce the corrosion rate from 400 mils per year to an average of from 2 to 5 mils—a loss negligible in the usual commercial operating life of equipment. The presence of copper, in solution, vitiates the effectiveness of arsenic as an inhibitor, amounts up to twice those being required for copper-free solutions being required to obtain commensurate protection. The copper is believed to impair polarization, and thus to interfere with the formation of the protective arsenic film. Periodic application of arsenic is ineffective; continuous treatment is required, using any of the trivalent compounds of arsenic which may be readily available. Toxic qualities of various types were discussed, but believed to be of minor import.

Plastics for Corrosion Control

By J. W. SHACKLETON, E. I. duPont de-Nemours & Company, Arlington, N. J.

Stating that his paper was intended to cover plastics to stop chemical corrosion, the speaker outlined progress to date in the development of barriers; coatings, linings and other materials which would halt corrosion-causing elements before they could reach the underlying metal. The paper was a forecast of what might be expected from plastics in the near future. Acrylic resins, such as lucite, were considered from the viewpoint of corrosion resistance and applicability, and the limitations of each type set forth.

Polythiene resins, using the term to cover a number of related plastics, appear to offer excellent prospects for corrosion protection. Powdered, the plastic has been applied with the metallizing gun, the powder being forced into the gun under pressure and sprayed hot to the surface to be protected. Some degradation of the plastic in the gun is experienced. Sheeting is being applied for tank protection, as this resin resists oxidizing acids.

Thermoplastic resins, with a temperature range in use of from —70 to as high as 500° F. are being developed and used for special applications such as packing. Teflon, a most resistant plastic, seems to offer the best corrosion-resistant qualities of any plastic as yet known. It is extremely hard to fabricate, however, and so far has been formed only by extruding. Pipe can be formed in this manner, with integral jointings, and wire can be covered, although at a relative slow rate. The material is machineable, and may be formed into gaskets, seals, and the like. The material is highly resistant to acids, alkalies and, so far, has no known solvent, precluding its application as a solution from which the solvent is allowed to evaporate, leaving the basic material as a film. Further research is in progress on this group of plastics, and developments may be expected within the year.

Control of External Corrosion On Plantation Pipe Line

By ALAN C. NELSON, Plantation Pipe Line Company, Atlanta, Ga.

Laid in soil which showed extremely low as well as extremely high resistivities, the line was coated only through the "hot spots," the remainder of the line being laid bare. Four classes of corrosion were recognized and studied separately; they were stations, tank bottoms, main line sections, and drainage problems.

At stations, resistivity was found to be lowered under the slag walks and clear areas established at valve wheel control points.

Rectifiers were used in cathodic protection where low-resistivity soils were traversed, and there gave excellent results. When the soil resistivity was high, anodes of either magnesium or aluminum were used, due to the difficulty of establishing ground beds in such soils.

In high-resistivity locations, tank bottoms were protected by burying a magnesium anode at each of the four water draw-off points; while in low-resistivity areas nine anodes were spaced around each tank and it was insulated from the manifold with special gaskets in the flange unions.

The method for combatting drainage currents from an electric line were discussed, and the utilization of a half-cell rectifier as a means of controlling frequent and destructive current reversals was described.

Alloying Steels for Corrosion Resistance To Gas Condensate Fluids

By K. EILERTS and FAYE O. GREENE, Petroleum Service Station, U. S. Bureau of Mines, Bartlesville, Okla.

Report was made on laboratory tests being run on various alloys to determine the most effective metal to be subjected to actual field tests in the attempt to minimize corrosion losses in high-pressure, high-velocity flow in gas condensate well equipment.

Based on three types of corrosive fluids, carbonic acid, propionic acid and phenol, coupons of nickel steel with varied nickel content were exposed for one day, 7 days, 28 days and 70 days in the reagents, being cleaned and weighed at the end of each period to determine corrosion loss. A check sample of carbon steel was run with each tests to determine relative values of plain and alloy materials. It appears that in carbonic acid nickel under 8.6 percent is no more effective than carbon steel, while above that point its effective corrosion resistance increases rapidly. Chromium in percentages in a similar set of tests under 5 percent likewise confers no added corrosion resistance.

Of the three reagents used, tests indicated that carbonic acid was most destructive, propionic acid next, and phenol third. With each of these, there was correlation between the effectiveness of the film of corrosion products in slowing down metal loss, as shown by the tests of 28 and 70 days' duration against the initial loss on the short-time tests.

Arab Kingdom of Yemen Negotiating With Americans for Oil Development

The independent Arab kingdom of Yemen has opened negotiations with American petroleum companies looking toward a new program for the development of Yemen's oil resources. Yemen is on the southeast tip of the Arabian peninsula, with an area of 75,000 square miles. Terms covering leasing, royalties and operating conditions are now being drawn up in the kingdom's capital, San'a.

"Our mineral resources are almost unimaginable," Yemen's delegate to the Arab League said. "The Italians, about 1924, were the first to inventory our soil, and they sought a blanket concession on the whole kingdom. We refused. Then some Dutch oil interests visited us, but decided that production and transportation costs would not justify a test. Next came the Russians, and we signed a treaty with them which is still in force. We even formed a Russian-Yemenite corporation for oil prospecting in the region of San'a, but efforts failed and the joint company is now dormant.

"Then it was the turn of the Americans. During the last few years they conducted a test in the Yemen mountains and asked, after that, a blanket concession. Our king has refused; he wishes to guard our own oil deposits but he consented to jointly exploit them with the aid of American technicians. That is where the matter now rests, and negotiations are proceeding on that basis with the American companies."

El Kadi also revealed that negotiations are under way with French interests. Yemen's royal prince has declared that Arab capital must be associated in the development program, and toward that end an Egyptian company is being formed in Cairo.

Austrian Production Up But Still Under Prewar

Austrian crude production last year nearly doubled that of 1945 but was approximately one-third under the maximum output forced by the Germans in 1944, the Department of Commerce has learned. A report placed the 1946 output at approximately 5,732,496 barrels, compared with 3,076,304 barrels in 1945 and 8,219,288 barrels in 1944.

Production was suspended when the fighting reached the oil area in the spring of 1945, and thereafter the Soviet forces seized about 50,000 tons of oil-field equipment, leaving behind only that which was actually in use, with a bare minimum of replacement parts. As a consequence, it is impossible to drill new wells or rehabilitate existing ones, and production this year is expected to show a decline to a point where it is insufficient to meet Austrian demand unless equipment is obtained and important new fields are discovered.

All of the oil being produced is controlled and allocated by the Soviet authorities, who claim for reparations 72 percent of the production properties, about 50 percent of the refining capacity and nearly all lands which are known to have real prospects for future oil discovery.

Hungarian-Soviet Interests Organize New Oil Companies

Two new companies have been formed by Hungarian and Soviet oil interests. The Maszovol Company will be concerned with the exploration for and exploitation of gas and oil deposits and the Molaj Company with refining and distribution.

Maszovol will undertake oil prospecting over a large area on the left bank of the Danube, which includes the former German Winterschall concession, now transferred to the USSR as war booty, and another concession negotiated with the Hungarian government. Molaj has a 2-million-barrel refinery at Szony.

Up to mid-1946 the number of wells drilled in the Lispe oil field area in Hungary was 307, of which 147 were in production. The largest field is Lovaszi, with 52 producers. Other fields in this area are at Budafapuszta and Habat.

First Sinclair-Ethiopian Well Likely Late in 1948

Sinclair Oil Corporation hopes to complete its first wildcat test by the latter part of 1948 in its Ethiopian oil concession, A. E. Watts, executive vice president, has announced.

First units of rotary equipment capable of drilling 15,000 feet are expected to be shipped by July 1 from the United States. Sinclair has a 50-year concession on Ethiopia's 350,000 square miles.

Trinidad Production

The Antilles Petroleum Company (Trinidad) Ltd., a subsidiary of the McColl-Frontenac Oil Company, produced 538,893 barrels of oil in 1946 as compared with 304,102 barrels in 1945. Seven successful wells were drilled during the year, and an expanded drilling program is slated for 1947.

Premier (Trinidad) Oilfields Ltd. recently completed four new wells on its San Francique property. Weekly production from this field now is 2800 barrels as compared with 1380 barrels previously.

Mattei on Study Group

Albert C. Mattei of Honolulu Oil Corporation, San Francisco, has been asked by Secretary of War Robert P. Patterson to join 14 other leading business executives in making a study in Germany of the industrial and export problems of the combined American and British occupation zones.

Oil Prospecting License Is Granted in Australia

The Zinc Corporation, a British company operating in Australia, has been granted an oil prospecting license in the northeastern part of South Australia, near the New South Wales boundary. This corporation has recently joined forces with D'Arcy Exploration Company (Anglo-Iranian) and Vacuum Oil Company in their projected operations. Widespread geological and geophysical surveys will start immediately.

A permit to search for oil has also been issued to Australian Mining and Smelting Company. This covers 9000 square miles in the Victoria River area in the west of the Northern Territory. Traces of oil have been reported in this region from the eastern end of the Kimberley structure.

Canadian Provinces Seek Increased Oil Prospecting

Two Canadian provinces—British Columbia and Manitoba—have adopted new oil and gas regulations in an effort to encourage increased prospecting.

British Columbia's regulations will be administered by the Minister of Lands and Forests, through a controller, Dr. T. B. Williams, petroleum geologist from Calgary, long experienced in the consulting field in Western Canada. Manitoba's regulations will be administered by the Department of Mines and Natural Resources through the Director of Mines, Dr. George M. Furnival, experienced in Alberta as district geologist and later as superintendent with The California-Standard Company.

Pechelbronn Production Doubles Output of 1945

Crude oil production in the Pechelbronn field, France, during 1946 amounted to 231,294 barrels as against 105,644 barrels in 1945. By the end of 1946, the total monthly output had exceeded 28,000 barrels or 70 percent of the prewar output.

During the year, Pechelbronn Societe Anonyma d'Exploitations Minieres, operator of the Pechelbronn concession, drilled 31 tests, including four wildcats for a total footage of 60,436 feet. Of the tests, 21 were completed as oil producers in the Pechelbronn, six were dry holes as were the four wildcat tests. At the end of the year, the Pechelbronn field had 707 producing wells.

Brazil Ups Output

Crude oil production in Brazil during February totaled 8811 barrels which was a slight increase over the 8798 barrels produced in January.

The Candeias field, with 12 producers, accounted for 7854 barrels of the February total while two wells in the Aratu field produced 238 barrels. The Lobato-Joanes field, with two wells, produced 719 barrels. No production was recorded for the Itaparica and Pitanga fields. These fields had single wells flowing in January.

Tank Car Arrangements Boost West Texas Take

West Texas and Southeastern New Mexico fields are to be given a substantial increase in crude market outlets through the use of tank cars to supplement pipe lines.

Sinclair Refining Company April 1 began moving 1800 barrels daily of Lea County, N. M., mixed grades of crude gathered for its account by The Texas-New Mexico Pipe Line Company and loaded at a 18-car capacity rack near Jal for consignment to the British American Oil Company, Ltd.'s Canadian refineries. Sinclair contracted to supply this volume of oil for a year.

Malco Refineries, Inc., operator of a refinery at Roswell and sole outlet for the Cap Rock 65-well field, has sold 500 barrels daily of refinery heavy ends for use as fuel in an Ohio steel mill, deliveries to be by tank cars. This sale enables Malco to take about 25 barrels daily per well of the 40-barrel daily allowable.

Atlantic Pipe Line Company is erecting a 50-car capacity rack adjacent to its Midland, Texas, terminal to supplement its pipe line shipments of crude, averaging 41,000 barrels daily, to its coastal terminal at Atreco, near Beaumont.

The company plans to move at least 5000 barrels daily of West Texas crude from Midland in trainload lots to Longview, where the oil will enter the company's East Texas-Atreco 10-inch trunk line.

Arizona Gas Loop

The Federal Power Commission has granted temporary authorization to El Paso Natural Gas Company to construct and operate 17 miles of 6-inch natural gas pipe line to loop the company's 8-inch gas line serving Morenci, Ariz., the new line to supply the Phelps Dodge Corporation's mine and smelter.

The company stated that it had the necessary pipe which assured early completion.

Wood County Extension

Talco Pipe Line Company, which serves the Talco Asphalt & Refining Company's asphalt refinery at Mount Pleasant, Texas, has completed an extension of its Wood County system from the Normal-Paul field to the Merigale field, using 5 miles of 4-inch discharge line. The Merigale area has 26 flowing and pumping wells.

Contract Let for Products Line, Borger to Colorado

H. C. Lile Construction Company, Oklahoma City, has been awarded contract to construct 215 miles of 6⅝-inch products pipe line for Phillips Petroleum Company and Shamrock Oil & Gas Company from Borger, Texas, to La Junta, Colo. This is the first leg of the two companies' 360-mile products line running from Borger, site of Phillips' refinery, via McKee, Texas, site of Shamrock's refinery, through La Junta to Denver. Phillips is handling construction of the joint line and will be the operator. Pump stations will be at Borger, McKee and La Junta.

Delivery terminals will be located on the finished line at La Junta and Denver.

Southern Natural Seeks Permits for Extensions

Two applications, involving an increase in the capacity of its system from 255,000 to 490,000 Mcf daily and extension of service to large areas in northern Florida, southern Georgia and South Carolina at an estimated cost of $50 million, have been filed with FPC by Southern Natural Gas Company.

One application, replacing an earlier request for authority to increase capacity to 305,000 Mcf daily, calls for construction of a 375-mile 24-inch line from the Gwinville gas field to Atlanta and some 328 miles of extensions and loops, with the necessary compressor capacity, which would enable it to meet increasing demands of present customers and extend service to Chattanooga and Knoxville, Tenn., and other communities in Tennessee and Alabama.

The second application covers a 225-mile 16-inch trunk line from the proposed Gwinville-Atlanta line to Colfax, Ga., with extensions of 155 miles to Tallahassee and 165 miles to Jacksonville, Fla.; 54 miles to Savannah, Ga., and 182 miles to Georgetown, S. C., with five compressor stations aggregating 31,600 horsepower.

The company explained that it would construct the facilities covered by the first application during this year and 1948 and those in the second application in 1949 and 1950.

Stripper Subsidy Meet

The first meeting of the Interstate Oil Compact Commission's stripper well committee will be held in St. Louis, today, April 14, Don T. Andrus, Bradford, Pa., committee chairman, has announced.

Stripper well committees appointed by the Independent Petroleum Association of America and the National Stripper Well Association will meet with the compact committee so the work can be coordinated.

Eminent Domain for Gas Lines Provided in Bill

Legislation giving natural gas companies eminent-domain rights to rights-of-way for constructing lines for which they have Federal Power Commission approval has been introduced in both houses of Congress.

The legislation would permit court assistance in acquiring properties necessary for natural gas pipe lines, compressor stations or other necessary facilities when they cannot be acquired by contract or an agreement cannot be reached with owners as to compensation. Cases involving small sums would be handled by the state courts with federal tribunal jurisdiction only when the amount claimed exceeds $3000.

Shell Sells West Texas Crude as Refinery Idle

Shell Oil Company is disposing of surplus crude production and purchases in West Texas and the East Texas field to other firms while its Houston refinery is strike-bound. Operation of Shell Oil Company's trunk line from the East Texas field to Houston was temporarily suspended to avoid congestion at the refinery tank farm, and arrangements were made to divert 150,000 barrels of East Texas field crude to The Atlantic Refining Company and 55,000 barrels to Humble Oil & Refining Company.

The company has made a spot sale of 300,000 barrels of West Texas crude to Eastern States Petroleum Company, making deliveries to the latter's refinery near Houston.

Mississippi Extension

Construction is under way on 18 miles of new pipe line in Adams County, Mississippi, which will extend Interstate Oil Pipe Line Company's line from Cranfield Station into Carthage Point field. Contract is held by Associated Contractors and Engineers, Houston.

The new line will consist of 18 miles of 6-inch line southwest out of Cranfield Station, into La Grange field, and eight miles of 4-inch line from there to Carthage Point.

Sheridan-Deer Park Line To Be Completed June 15

Smith Contracting Company, Fort Worth, has started work on Shell Pipe Line Corporation's 110-mile 6-inch products pipe line running from Shell Oil Company's natural gasoline plant in the Sheridan field, Colorado County, Texas, to Shell's Deer Park refinery near Houston. Completion will be about June 15.

The Sheridan plant processes about 80 million cubic feet of gas daily and at present is dependent upon tank cars for delivery of production to the Deer Park plant. A single booster station will be located at the Sheridan plant.

Mid-Continent Expansion By Northern Natural OK'd

The Federal Power Commission has approved Northern Natural Gas Company's $12,441,000 expansion project to increase its line capacity from 325 to 407 million cubic feet of gas daily by construction of approximately 185 miles of 16- to 24-inch loop and tie-in line and additional compressors on its system in Oklahoma, Kansas, Nebraska and Iowa.

Northern Natural's other application filed with the FPC would increase the capacity of the line to 580 million cubic feet daily, this covering installation of 320 miles of 26-inch, 245 miles of 24-inch, 17.3 miles of 20-inch, etc., at a cost of $24½ million.

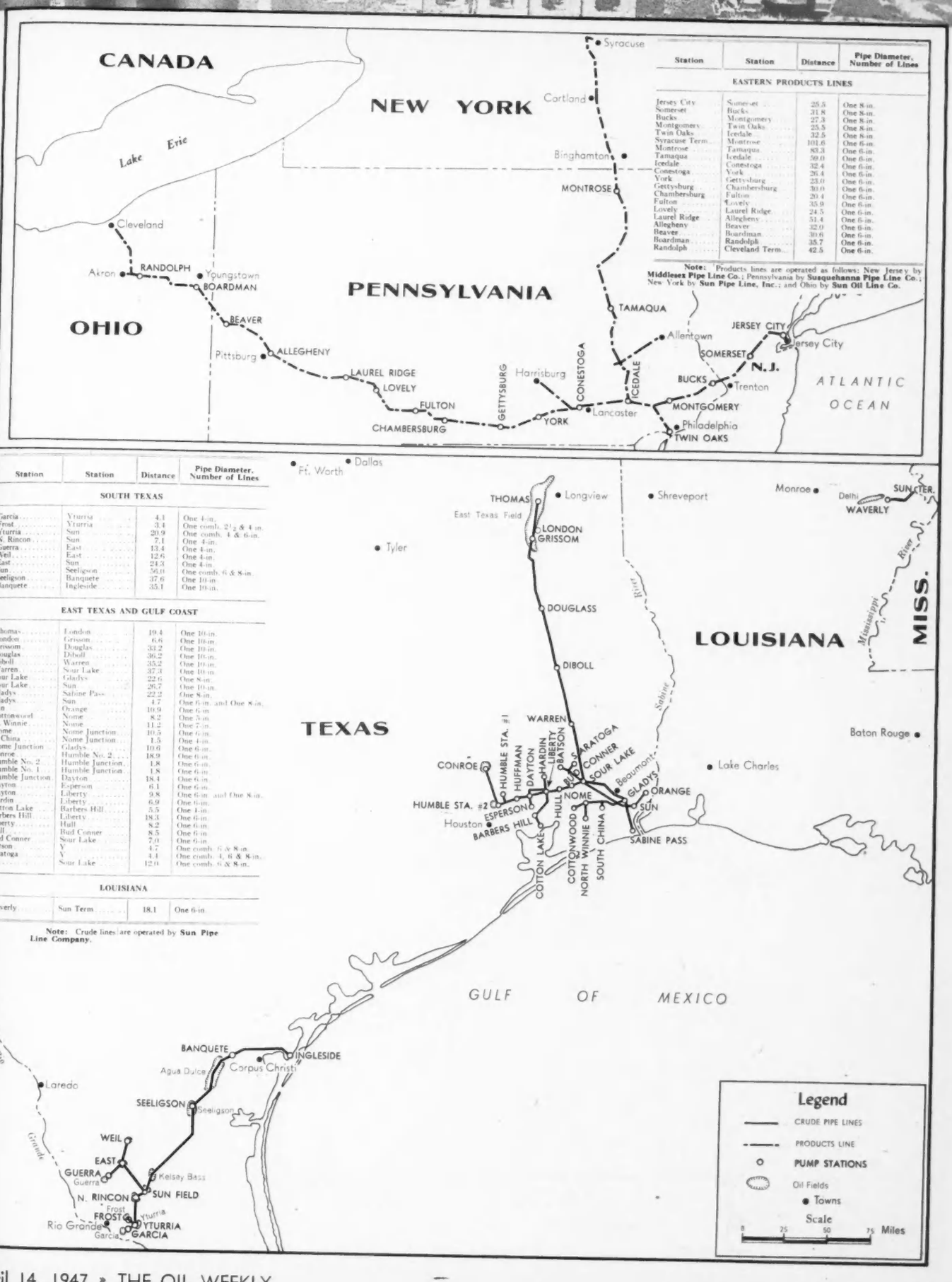
Pope Reappointed

J. A. Pope of Alamo, Ga., has been reappointed by Governor Thompson as a member of the Georgia Oil and Gas Commission. Pope's present term expires May 18.

Pipe Lines of the U. S.

Sun Oil Company

Tenth of a Series



EASTERN PRODUCTS LINES

Station	Station	Distance	Pipe Diameter, Number of Lines
Jersey City	Somerset	25.5	One 8-in.
Somerset	Bucks	31.8	One 8-in.
Bucks	Montgomery	27.3	One 8-in.
Montgomery	Twin Oaks	25.5	One 8-in.
Twin Oaks	Icedale	32.5	One 8-in.
Syracuse Term.	Montrose	101.6	One 6-in.
Montrose	Tamaqua	83.3	One 6-in.
Tamaqua	Icedale	59.0	One 6-in.
Icedale	Conestoga	32.4	One 6-in.
Conestoga	York	26.4	One 6-in.
York	Gettysburg	23.0	One 6-in.
Gettysburg	Chambersburg	30.0	One 6-in.
Chambersburg	Fulton	20.4	One 6-in.
Fulton	Lovely	35.9	One 6-in.
Lovely	Laurel Ridge	24.5	One 6-in.
Laurel Ridge	Allegheny	51.4	One 6-in.
Allegheny	Beaver	32.0	One 6-in.
Beaver	Boardman	30.6	One 6-in.
Boardman	Randolph	35.7	One 6-in.
Randolph	Cleveland Term.	42.5	One 6-in.

Note: Products lines are operated as follows: New Jersey by **Middlesex Pipe Line Co.**; Pennsylvania by **Susquehanna Pipe Line Co.**; New York by **Sun Pipe Line, Inc.**; and Ohio by **Sun Oil Line Co.**

SOUTH TEXAS

Station	Station	Distance	Pipe Diameter, Number of Lines
Garcia	Yturria	4.1	One 4-in.
Frost	Yturria	3.4	One comb. 2½ & 4 in.
Yturria	Sun	20.9	One comb. 4 & 6-in.
N. Rincon	Sun	7.1	One 4-in.
Guerra	East	13.4	One 4-in.
Weil	East	12.6	One 4-in.
East	Sun	24.3	One 4-in.
Sun	Seeligson	56.0	One comb. 6 & 8-in.
Seeligson	Banquete	37.6	One 10-in.
Banquete	Ingleside	35.1	One 10-in.

EAST TEXAS AND GULF COAST

Thomas	London	19.4	One 10-in.
London	Grissom	6.6	One 10-in.
Grissom	Douglas	33.2	One 10-in.
Douglas	Diboll	36.2	One 10-in.
Diboll	Warren	35.2	One 10-in.
Warren	Sour Lake	37.3	One 10-in.
Sour Lake	Gladys	22.6	One 8-in.
Sour Lake	Sun	26.7	One 10-in.
Gladys	Sabine Pass	22.2	One 8-in.
Gladys	Sun	4.7	One 6-in. and One 8-in.
Sun	Orange	10.9	One 6-in.
Cottonwood	Nome	8.2	One 5-in.
N. Winnie	Nome	11.2	One 7-in.
Nome	Nome Junction	10.5	One 6-in.
S. China	Nome Junction	1.5	One 4-in.
Nome Junction	Gladys	10.6	One 6-in.
Conroe	Humble No. 2	18.9	One 6-in.
Humble No. 2	Humble Junction	1.8	One 6-in.
Humble No. 1	Humble Junction	1.8	One 6-in.
Humble Junction	Dayton	18.4	One 6-in.
Dayton	Esperson	8.1	One 6-in.
Dayton	Liberty	9.8	One 6-in. and One 8-in.
Hardin	Liberty	6.9	One 6-in.
Cotton Lake	Barbers Hill	5.5	One 4-in.
Barbers Hill	Liberty	18.3	One 6-in.
Liberty	Hull	8.2	One 6-in.
Hull	Bud Conner	8.5	One 6-in.
Bud Conner	Sour Lake	7.0	One 6-in.
Batson	Y	4.7	One comb. 6 & 8-in.
Saratoga	Y	4.4	One comb. 4, 6 & 8-in.
Y	Sour Lake	12.0	One comb. 6 & 8-in.

LOUISIANA

Waverly	Sun Term.	18.1	One 6-in.

Note: Crude lines are operated by **Sun Pipe Line Company.**

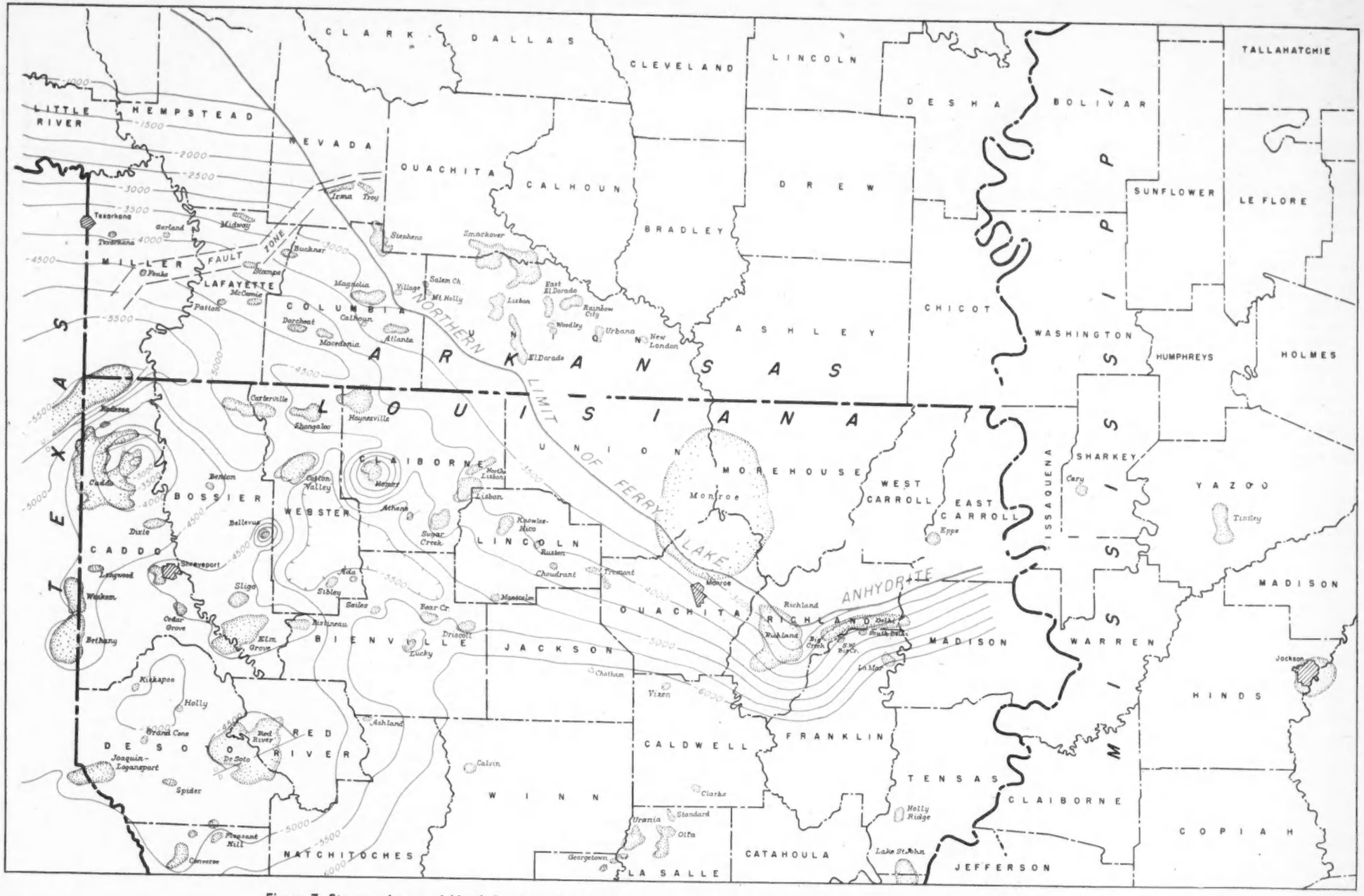


Figure 7. Structural map of North Louisiana-South Arkansas area with contours drawn on the base of the Ferry Lake anhydrite.

UNCONFORMITIES to Play Major Role In Arkansas-North Louisiana Discoveries

Part 3. Truncation Around a Few Local Uplifts

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and

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THE major part of the movement of many of the larger uplifts in the North Louisiana area occurred prior to the deposition of Upper Cretaceous beds. The erosion interval between emergence of the Comanche Cretaceous surface and the deposition of the Gulf Cretaceous beds allowed the upper part of the Comanche Cretaceous beds to be truncated. This condition exists around many of the larger uplifts in the area in addition to the Monroe uplift-Sharkey platform area that was briefly described in Part 1 of this paper. (THE OIL WEEKLY, March 31 issue.)

Caddo-Pine Island Uplift

The closure around the Caddo-Pine Island uplift on the base of the Ferry Lake Anhydrite represents the greatest closure in the North Louisiana-Arkansas area (Figure 7). Pre-Gulf Cretaceous uplift in this area amounted to more than 2000 feet. Erosion following uplift resulted in the removal of the Washita and Fredericksburg groups, the entire Paluxy formation and most of the Mooringsport formations from the crest of the dome. The truncated edges of these formations were covered by Gulf-Cretaceous sediments (Figure 8). Much of the production from the south and west flanks of this uplift comes from truncated Paluxy sands. This condition has been understood for some time but it is only recently that enough electric logs have become available in this area to permit accurate correlation of the sands. Even now, the paucity of electric logs in the area makes it very difficult to determine with exactness the position of the truncated edges of the sands. It is the opinion of the writers that the next decade will witness the east and north flanks of the Caddo-Pine Island area produce oil from truncated Paluxy sands similar to those of the west and south flanks.

Monroe Uplift—Sharkey Platform Area

The structural uplift constituting the Monroe uplift-Sharkey platform area has the largest areal extent of any uplift in the North Louisiana-Southern Arkansas area with the possible exception of the Sabine uplift. This uplift is between the Desha Basin on the north and the lower Mississippi basin on the south and brings beds of the Cotton Valley formation to within 3050 feet of the surface (Figure 9).

At the present time, the most important feature of this uplift to petroleum geologists is the Delhi area where oil and gas are being produced from the Delhi, West Delhi, Big Creek, Southwest Delhi, South Big Creek, and Lamar fields. These fields were described in Part 1 of this paper where it was pointed out that excellent prospects for new oil discoveries exist in this area. In addition to the Delhi area, the Monroe uplift-Sharkey platform area is of considerable economic importance because of the Monroe and Richland gas fields.

The Monroe gas field was discovered in 1916 by the Progressive Oil and Gas Company's Fisher 1 in 37-20n-5e[3]. This field originally constituted a major gas reserve and has been supplying large quantities of gas for both domestic and commercial use since its discovery. Production is principally from the Monroe gas rock but some production comes from the "second sand." This "second sand" is strictly related to the unconformity and actually consists of several horizons that have ben truncated and overlapped by the Monroe gas rock. In some places, the gas from the "second sand" comes from truncated sand bodies in the Trinity and in other places from truncated sands of lower Gulf age that have been variously termed at one time or another as Woodbine, Tokio, and Tuscaloosa.

The Richland gas field situated southeast of the Monroe gas field was discovered in 1926 by Gulf Refining Company's England Planting Company 1, 32-17n-6e[4]. This field is genetically related to the Monroe gas field but remained undiscovered for ten years after the discovery of the Monroe field.

Production from the Richland gas field is principally from lower Gulf (Upper Cretaceous) sands that have been variously termed Tokio, Woodbine, and Tuscaloosa but some production is from the Monroe gas rock and from a thin sand (Eubanks zone) occurring in the lower Glen Rose. The producing zone from the lower Gulf sands lies immediately beneath the nonconformity at the base of the Eocene and the gas production comes from the truncated edge of the lower Gulf sands. The geology of the producing sands is much the same as that of the Delhi area.

The principal prospects for future production from the Monroe uplift-Sharkey platform area are in the truncated sands around the southeastern, eastern and northeastern flanks of the uplift and in the area between the Monroe and Richland gas fields. The fact that truncated porous zones in the Monroe and Richland gas fields and truncated and overlapped sands of the Delhi area are now producing, has given considerable impetus to the search for future oil and gas reserves in this area from similar traps.

The Bellevue area was uplifted about 1000 feet prior to the deposition of the Gulf Series, Upper Cretaceous. All of the Lower Cretaceous (Comanchean) beds above the Rodessa formation were removed from the crest of the dome. Several wells have been drilled around the flanks of this uplift in the search for Paluxy production and some excellent shows have been reported (Figure 10). However, to date no commercial production has been found. Recently there has been some active leasing on the flanks of this old dome and it is very probable that in the future some wells will be drilled in an attempt to discover prolific Paluxy production at a depth of less than 3000 feet. At such a shallow depth, for example, a well drilled off the south flank would test the Paluxy, Mooringsport, Kilpatrick zone, Hill zone, Gloyd zone and Young zone.

Jackson Dome, Mississippi

The Jackson dome of Mississippi is separated from the Sharkey platform by a synclinal area in which the Tinsley and Kings fields are situated. The production in these fields is from Gulf Cretaceous and Comanche Cretaceous beds that are not present on the crest of the Jackson dome. All of the beds between the Midway shales of Tertiary age and the Cotton Valley formation of Jurassic age are truncated on the flanks of this dome. A few wells have been drilled in an effort to find flank production in truncated zones but none of these wells has met with success. A detailed study of the subsurface geology in this are should reveal enough information to make it advisable to locate and drill wells which might have excellent possibilities of discovering production at a depth of less than 3500 feet.

Other Areas

In addition to the areas already described, there are many other areas of local truncation in this North Louisiana region. Paluxy sands are evidently truncated on the flanks of the Shongaloo field, the Carterville field, the Lisbon field, and several others. Detailed subsurface study of these areas and the testing of warranted locations will almost certainly result in discoveries that will revive many of these old near-depleted fields.

References

[3] Fergus, Preston, Monroe Gas Field, Louisiana; pp 741-772 of Geology of Natural Gas; AAPG 1935.
[4] Gordon, Dugald, Richland Gas Field, Richland Parish, Louisiana; pp 773-786 of Geology of Natural Gas; AAPG 1935.

(See figures on following pages)

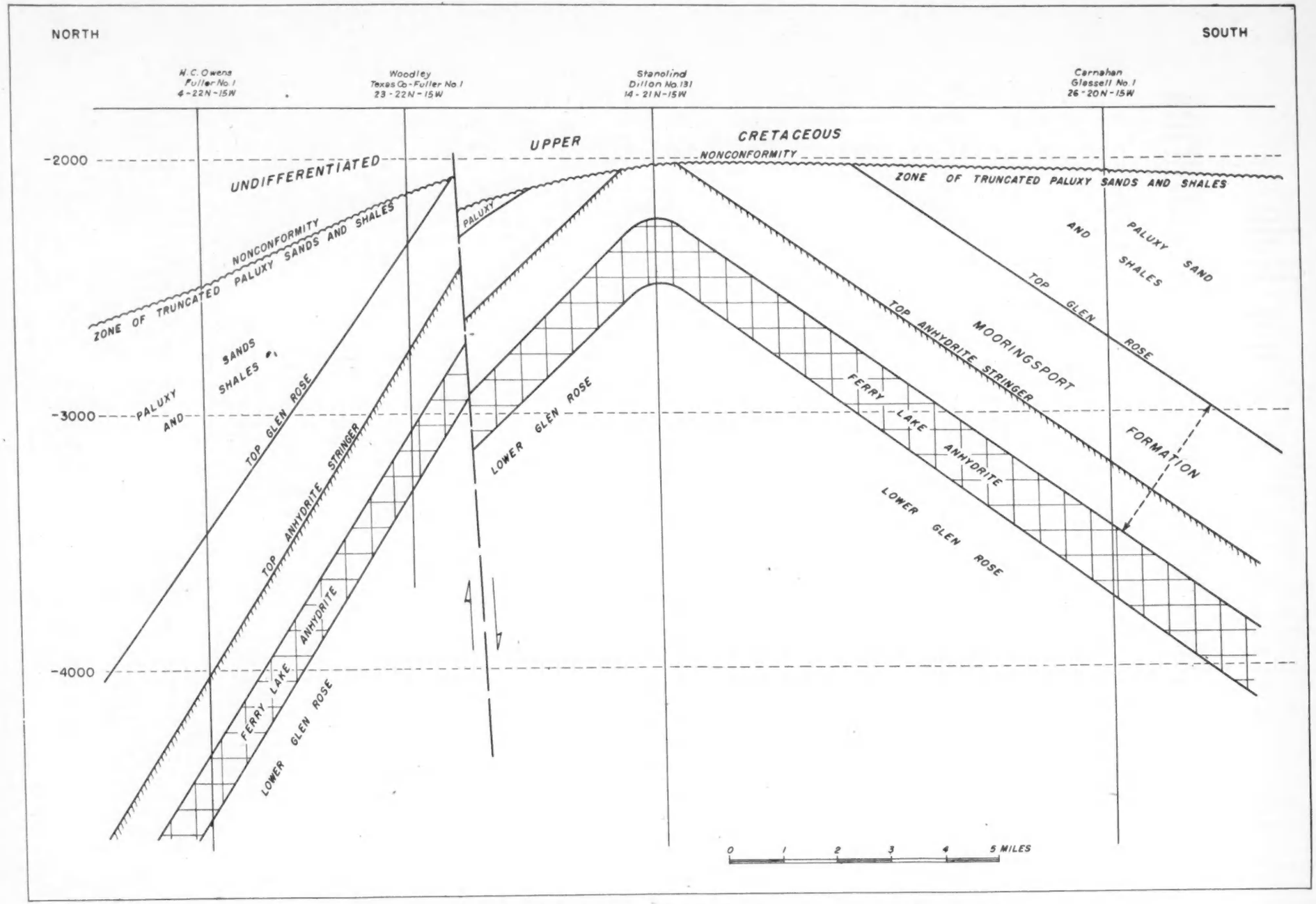

Figure 8. Cross section through Caddo-Pine Island dome showing formations truncated on the flanks.

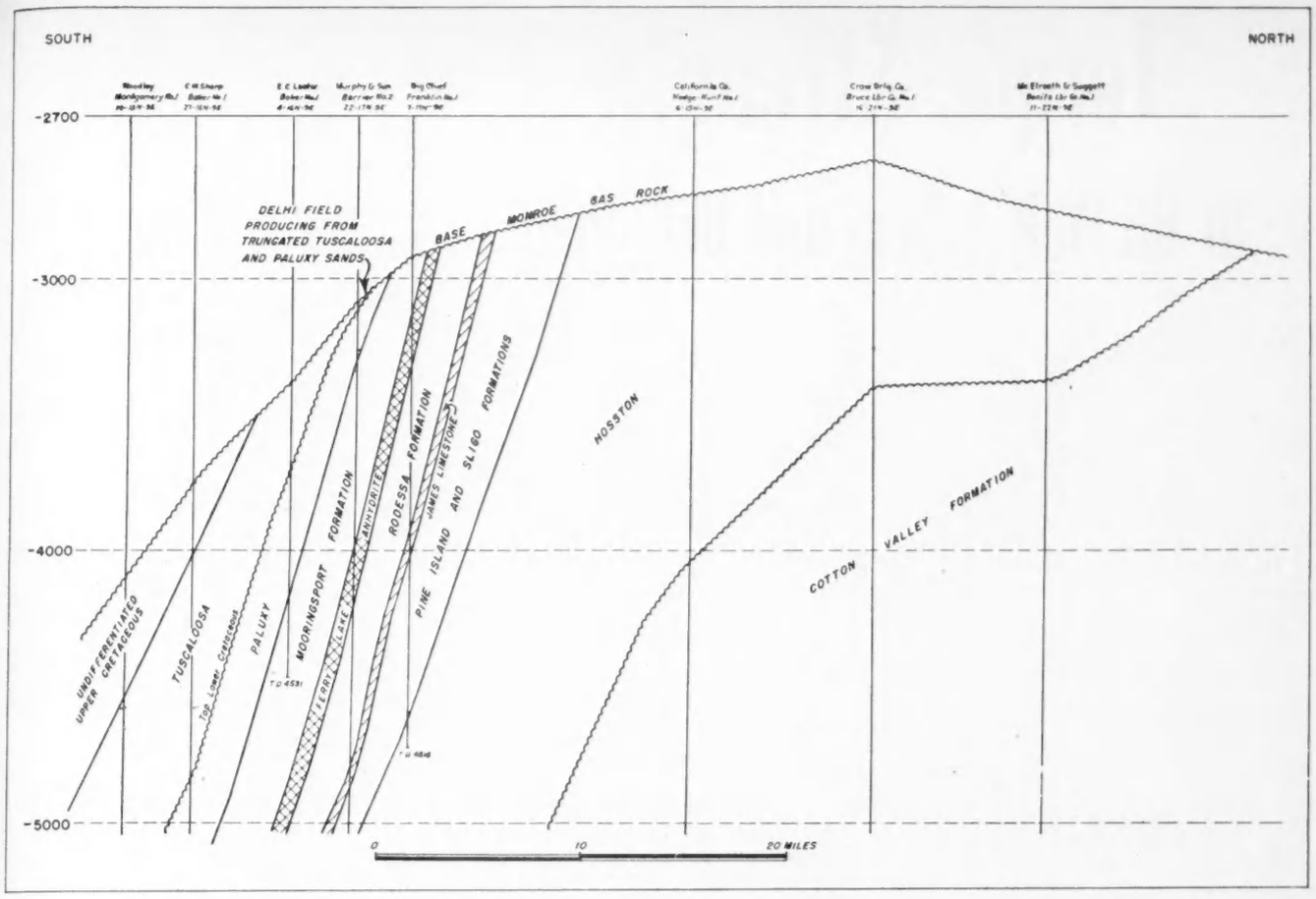

Figure 9. North-south section through southern part of the Monroe Uplift showing extent of truncation and overlap.

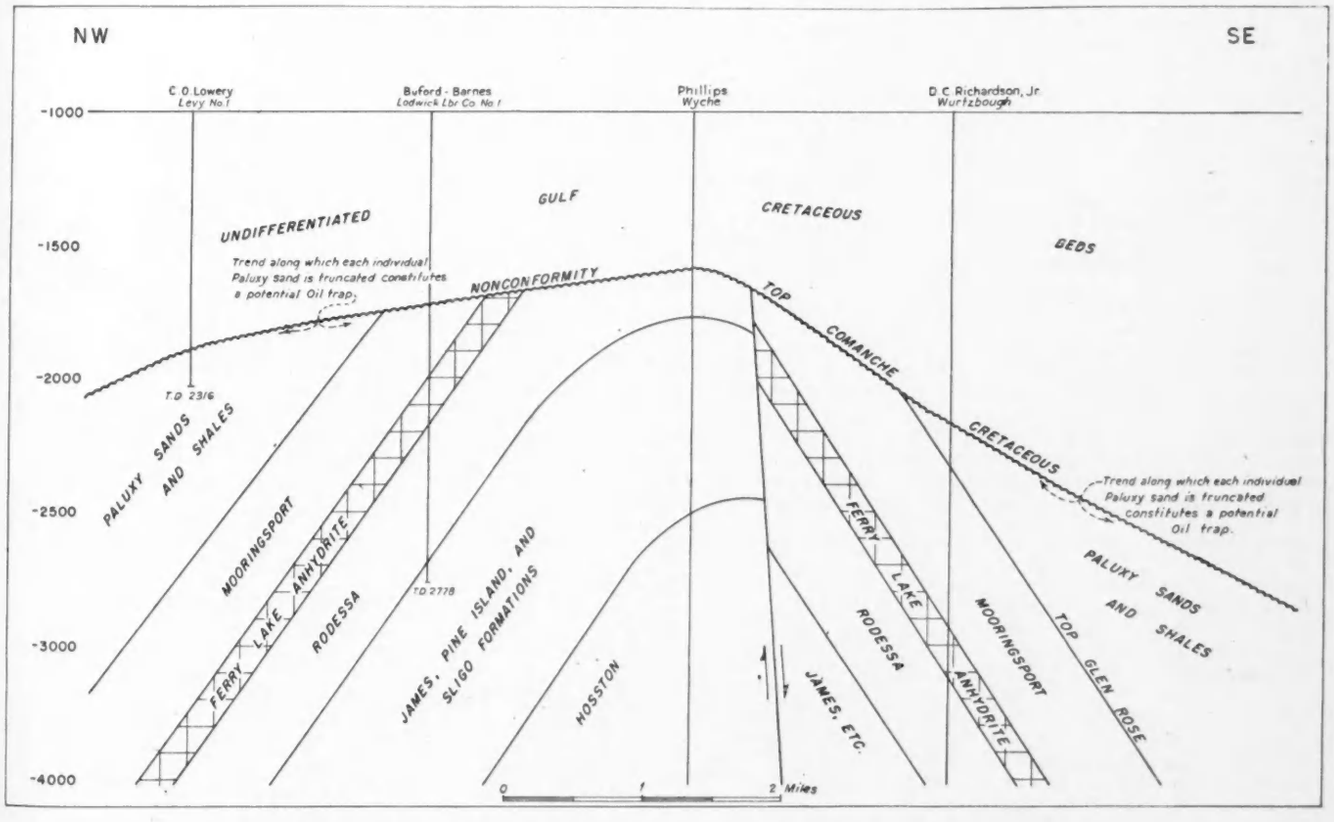

Figure 10. Cross section through the Bellevue Dome showing formations truncated on the flanks.

Figure 8. Cross section through Caddo-Pine Island dome showing formations truncated on the flanks.

Torque Strength

Of Oil Well Tubing and Drill Pipe

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THE need for adequate practical information relative to torque strength of all types of oil well tubular goods is extremely acute. Field personnel in the oil industry are severely handicapped by the lack of information on this subject.

With this thought, the following discussion is undertaken in the hope that by its application it will be of value to the supervising engineer as well as to the "tool-pusher."

The practical need for this information is immediately appreciated when it is realized that from the moment pipe in a well cannot be pulled a fishing job is in progress. If proper corrective measures carried to safe limits can be immediately applied there is a fair chance that full recovery of the pipe can be made, or at least no alibi need be offered for not applying adequate tension and/or torque necessary for recovery. Thus, a basis for allowable safe limits should be available in such simple form that it can be applied immediately to the problem.

The amount of allowable tension to be exerted on struck pipe can be determined easily by field personnel, but the amount of allowable torque to be applied is a problem on which even the most experienced fishing supervisor can at best make only a reasonable guess. This amount of allowable torque continues to present a serious problem during all fishing operations such as washing over, cutting, reversing or release of of tools involved.

Any information offered on the subject of allowable torque for oil well pipe must be in a usable form. That is, it must be measurable on the rig floor. No torque registering device yet offered to the industry provides the user with a direct reading of the actual torque imposed. Also, even if such an instrument were available, complete information would be needed on the maximum allowable torque. Since drill pipe is the only type of pipe offered to the industry strictly for rotation, it is the only type covered by published information on torque strength. Yet the majority of fishing is accomplished using oil well tubing, and rotation is necessary during most fishing jobs. The information offered on torque strength of drill pipe is usually in foot pounds and does not take into consideration the ever present combination of torque and tension or compression while the pipe is in the well.

The writer has determined the maximum allowable torque in a measurable quantity for all amounts of tension or compression for the popular sizes and types of oil well tubing and drill pipe.

Since there is no practical rig floor method to measure foot pounds of torque applied, a simple procedure whereby torque can be gauged is to count the number of revolutions the rotary spins back to the left after torque has been applied to the right, These revolutions will be called turns of backlash and for drill pipe should very nearly equal the number of turns applied to the right. For tubing, the backlash is less than the number of turns applied to the right until the thread make up has been accomplished.

Procedure

The writer has proceeded through the development of certain formulae, taken certain basic formulae, made certain assumptions, and applied the whole to the problem. From the application of the various formulae to the problem, it was a simple matter next to determine various tables, graphs, etc. These were then applied to the rig floor for obtaining usable information. Modifying factors were considered to make the information suitable to all conditions. Safety factors were discussed to make the information suitable to specific wells. Lastly, a sample situation was considered and a problem worked out using the information contained herein.

Theory and Development of Equations

From "Design of Machine Members" by Vallance and Doughtie and from development by the writer—Induced stress:

Consider the body in Figure 1 to have unit thickness and to be subjected to external forces Ft producing a direct unit tension stress St on the cross-sectional area. Imagine the body to be cut by a plane CB at any angle θ. If the left part of the body is removed, forces acting normal and parallel to the plane BC must be supplied to hold the right portion in equilibrium.

Resolving all forces acting on the right portion into components acting parallel to the plane BC, we have

(1) $ABSt\cos\theta - BCSp = O$

from which

(2) $Sp = (St\cos\theta)\frac{AB}{BC}$

$= St\cos\theta\sin\theta = St\frac{\sin 2\theta}{2}$

The stress Sp is a shearing stress along the plane BC and will be a maximum when $\sin 2\theta$ is a maximum, i.e., when θ is 45°. We then have for the maximum shear induced in a body by direct tension loading

(3) $Sstmax = \frac{St}{2}$

Now from the same references, combined shear and tension:

Consider the body shown in Figure 2 with the forces Ft and Fs acting as shown to produce direct tension and shear stresses. Since the body is in equilibrium, shearing forces must also act on the surfaces BC and DA. Taking moments about any point in the body, we have

$Ss \times AB \times BC = S2 \times BC \times AB$

and

(4) $Ss = S2$

showing that the unit shear stresses on the surfaces AB and BC are equal in magnitude.

If an imaginary plane BE at any angle θ cut away the left part of the body forces $Sn \times BE$ and $Sp \times BE$ must be supplied to maintain equilibrium. Resolving all forces acting on the right portion into components parallel to the plane BE, we have the three sets of force diagrams shown in Figure 3.

From Figure 3a

(5) $\text{Cos}\,\theta = BESpt/ABSt$ or $BESpt = ABSt\text{Cos}\theta$

From Figure 3b

(6) $\text{Sin}\,\theta = BESps/ABSs$ or $BESps = ABSs\text{Sin}\theta$

From Figure 3c

(7) $\text{Cos}\,\theta = BESpeass/EASs$ or $BESpeass = EASs\text{Cos}\theta$

But we know that the component parellel to BE, or BESp is made up of all the forces along BE caused by ABSt, ABSs, and EASs. Noting that EASs is a negative force, we have

(8) $BESp = BESpt + BESps - BESpeass$

Now substituting the values in (5), (6), and (7) in equation (8) we have

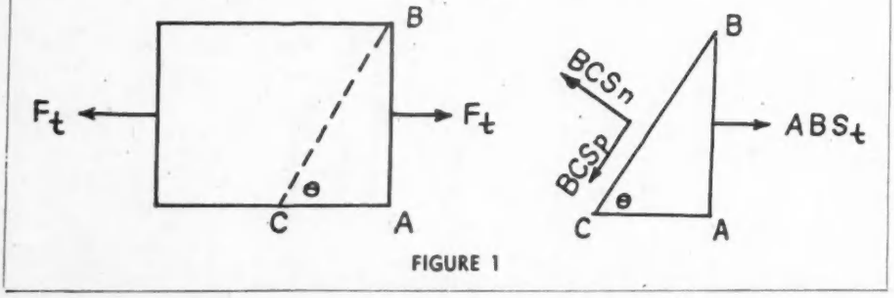

FIGURE 1

(9) $BESp = ABStCos\theta + ABSsSin\theta - EASsCos\theta$

Dividing through by BE, we have

(10) $Sp = \frac{AB}{BE} StCos\theta + \frac{AB}{BE} SsSin\theta - \frac{EA}{BE} SsCos\,\theta$

or

(11) $Sp = \frac{StSin2\theta}{2} - SsCos2\theta$

Differentiating with respect to θ and equating to zero, we find that Sp is a maximum when

(12) $Tan2\theta = -St/2Ss$

(13) $Sin2\theta = St/\sqrt{St^2 + 4Ss^2}$

and (14) $Cos2\theta = -2Ss/\sqrt{St^2 + 4Ss^2}$

Substituting these values in equation (11) and noting that Sp is a shearing stress on the plane BE, we find the maximum shear induced by the external tension and shearing loads to be

(15) $Ssmax = \frac{1}{2}\sqrt{St^2 + 4Ss^2}$

Squaring both sides, we have

(16) $Ssmax^2 = \frac{St^2 + 4Ss^2}{4}$

or (17) $Ssmax^2 = Ss^2 + \frac{St^2}{4}$

which is a vestor sum. If we let Ssmax be the hypotenuse of a right triangle and Ss and St/2 be the opposite sides, then we can construct Figure 4

From "Handbook of Engineering Fundamentals," by Eshback, for hollow shafts we find that

(18) $J = \frac{\pi (d^4 - d_1^4)}{32}$

where J = polar moment of inertia in inches^4
d = outside diameter in inches
d_1 = inside diameter in inches

and (19) $T = SsJ/C$

where T = Torque in inch-pounds
Ss = Shear in pounds/Inch^2
J = Polar moment of inertia in inches^4
C = Radius (to extreme fiber) in inches

From Boyd's "Strength of Materials," we find

(20) $\theta = \frac{Tl}{EsJ}$

where θ = angular displacement in radians
T = Torque in inch-pounds
l = Length of shaft in inches
Es = Modulus of rigidity
J = Polar moment of inertia in inches^4

From (19) and (20) we have

(21) $SsJ/C = \theta EsJ/l$

or (22) $Ss = \theta EsC/l$

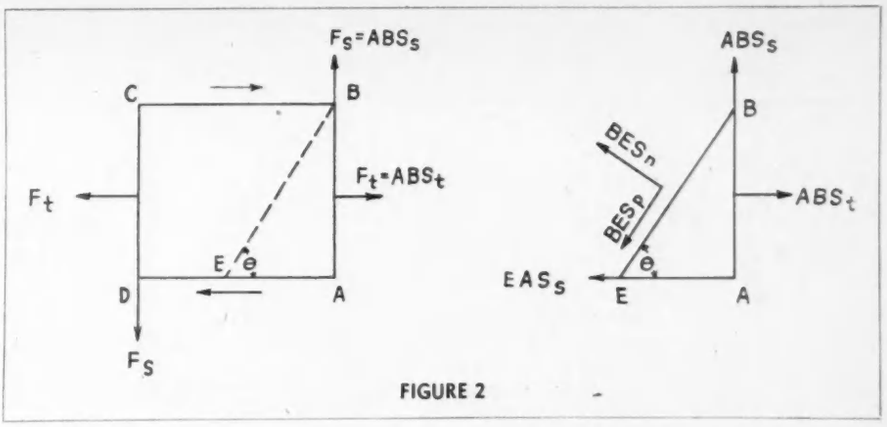

FIGURE 2

But (23) $\theta = 2\pi n$

where n = number of revolutions of the shaft when the shear stress is equal to Ss

Solving (23) for n and substituting in (22), we have

(24) $n = \frac{Ssl}{EsC2\pi}$

Now we can see a method of calculating the number of allowable turns of backlash for a given pull on the pipe.

1. Establish the maximum allowable shear assuming perfect pipe.
2. Assume a perfectly straight hole.
3. Taking various strains on the pipe, solve for Ss using equation (17).
4. Having determined Ss, next substitute this value of Ss in equation (24), and solve for n. When the value of l is 12,000 inches, n becomes the number of revolutions of backlash allowable per 1000 feet of the given pipe.

Assumption Used in the Calculations

1. Straight hole
2. Perfectly equalized mud, oil, water, or other fluid in the well.
3. New pipe.
4. Perfect pipe.
5. No corrosion on or in the pipe
6. No cuts or abrasions on pipe
7. 100 percent efficient joints—except those on plain tubing, for which less than 100 percent efficient joints, the yield of the pipe was lowered accordingly
8. Strength of plain tubing was based on the strength at the last engaged thread for calculating the information for Figure 9
9. Yield in shear assumed to be 60 percent of the yield in tension.
10. Values for the various strengths used are shown in Table 1.

Figures 5, 6, 7, and 8 give graphic results of calculations of the allowable backlash using the method stated.

Figures 9 and 10 are included for simplicity in determining the unit tensile stress due to the pull taken.

A cross-sectional area of API tubing and drill pipe is as follows:

Cross Sectional Area of API Tubing and Drill Pipe

SIZE	Actual O.D. Inches	Actual I.D. Inches	Weight/ Foot Lbs.	Cross Sectional Area, Inches^2
2⅜ Tbg.	2⅜	1.995	4.7	1.304*
2⅞ Tbg.	2⅞	2.441	6.5	1.812**
2⅜ D.P.	2⅜	1.815	6.65	1.842
2⅞ D.P.	2⅞	2.151	10.40	2.463
3½ D.P.	3½	2.764	13.30	3.621
4½ D.P.	4½	3.826	16.60	4.407

* 2⅜-inch plain tubing cross sectional area under last engaged thread = 0.9 inches^2.
** 2⅞-inch plain tubing cross sectional area under last engaged thread = 1.319 inches^2.

Field Application

Modifying factors: It easily can be seen that a modifying factor must be applied for each case in the field where this information is to be used. This factor must be based upon the following:

1. Age of the pipe
2. Condition of the pipe as to
   a. Coupling and pipe threads
   b. Coupling condition
   c. Tong marks
   d. Rust, pits, corrosion
3. Straightness of the well bore
4. Fluid—whether equalized inside and outside of the pipe
5. How near it is desired to approach the yield strength of the pipe.

Since there will always be one or more of the modifying factors present for any well and pipe conditions it can be seen that a modifying safety factor must be applied. It should be remembered at this point that the maximum allowable backlash has in every case been based on the yield shear strength of the pipe. This is the point at which permanent set will begin to take place. Therefore, in a perfect situation, this figure could be applied. In other words, the safety factor to be applied will depend upon only the pipe condition and the well condition—no other factors need be considered.

Taking each of the modifying factors to be considered in turn, Nos. 1 and 2 can be practically eliminated if the pipe is new. In considering No. 3, it should be remembered that a crooked hole will tend to cause a greater torque above a "dog-leg" than below, since the twist applied encounters difficulty in "passing through a dog-leg, and a greater than maximum allowable is apt to be put into the pipe in that section above a dog-leg. If the deviations from vertical are not too great it is of benefit to

TABLE 1

TYPE PIPE	Grade	Ultimate Tensile Stress	Yield Tensile Stress	Yield Shear Stress
Drill Pipe	Upset D	95,000#/in^2	60,000#/in^2	36,000#/in^2
Drill Pipe	Upset E	100,000	75,000	45,000
Tubing EU	D	95,000	60,000	36,000
Tubing PI	D	72,300	45,500	27,000
Tubing EU	N-80	100,000	80,000	48,000
Tubing PI	N-80	75,000	55,000	33,000
Tubing EU	J-55	75,000	55,000	33,000
Tubing PI	J-55	55,000	37,900	22,740

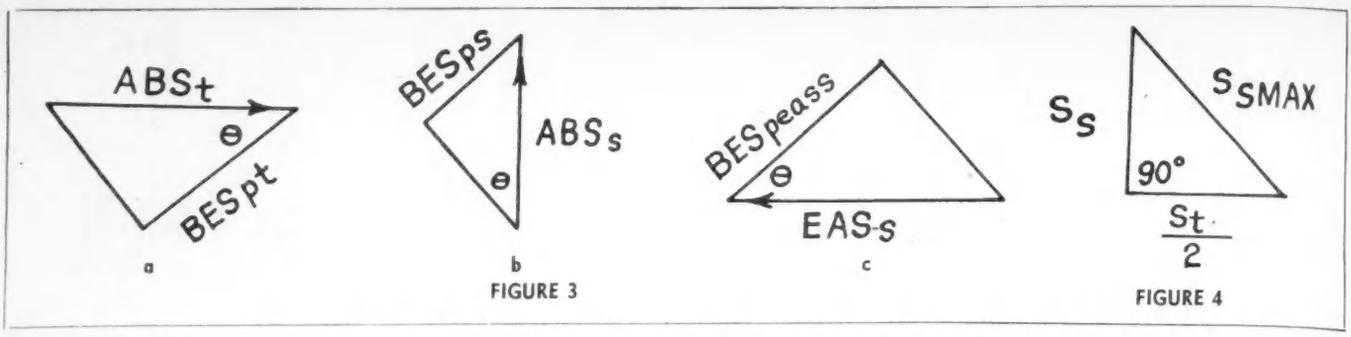

FIGURE 3

FIGURE 4

rotate at a slower speed in order to allow time for the twist to "work through" the string at these points. Even this will not eliminate the necessity of considering this modifying factor. A great deal of applied twist can be "held up" at any deviation point in the string.

No. 4 can be eliminated when the fluid in the pipe to be rotated is equalized with that in the annular space. This will eliminate a third force (bursting or collapse). No. 5, of course, is self-explanatory.

Considering all of the modifying factors it would seem that on the average a safety factor of possibly 0.5 should be applied, and that the torque should be increased only after carefully weighing the various factors listed against the particular well and pipe conditions.

Sample Well Problem

Given: 2⅜-inch OD EU Grade "D" API Tubing.

Packer on bottom.

Left by right threaded coupling originally set immediately above the packer.

Depth to packer is 6000 feet.

Hole is eight degrees off vertical, but with no sharp deviations indicated on the log.

Well on production for one year.

New tubing was used in original setting.

Well was drilled in with this same tubing.

Collars were not hammered.

Reasonably acurate weight indicator available.

Desired: To pull packer and reset.

Upon rigging up and attempting to pull the tubing and packer, it is found that the packer cannot be pulled with ordinary strain. From Figure 9, the maximum allowable pull is found to be approximately 77,000 pounds. This is the yield point, however, and a safety factor should be applied. From the conditions it would appear safe to take 75 percent or 57,750 pounds pull. After applying this amount, the packer still cannot be pulled. Now since the tubing cannot be pulled, it is decided to rotate the left-by-right coupling until the tubing alone can be pulled. then to wash down to packer and attempt to remove packer by jarring. The weight of the tubing from the surface to the packer is $4.7 \times 6000 = 28{,}000$ pounds (approx.).A pull of this amount is taken on the tubing. From Figure 9 we find that we have a tension of 21,500 pounds/in.^{2} Next using Figure 7 we find that the allowable backlash/1000 feet of free pipe equals approximately 4.5. We know that from experience in this particular field that wells seldom sand up more than a few hundred feet, so it is safe to assume the whole 6000 feet to be free pipe.

Therefore, $4.5 \times 6 = 27$, which is the total number of allowable turns of backlash. A safety factor of 0.5 is to be applied first, so this reduces the allowable backlash to 13 revolutions. Next, the tubing is rotated to the right 13 revolutions, the clutch released, and the backlash noted. Possibly no backlash will be in the rotary due to thread make-up. The procedure will be repeated, keeping the same tension on the tubing string, until either the coupling unscrews or until 13 revolutions of backlash are obtained. If the left hand thread does not unscrew, the revolutions of backlash may be gradually increased until the thread unscrews or until some other safety factor has been applied as determined by methods stated under Conclusions of this articles.

If results desired cannot be accomplished within the limits thus prescribed the supervisor should immediately turn to other fishing methods for recovery such as reversing or cutting, thereby finding ample reward for his intelligence in so doing by having a simple, fast and efficient fishing job not complicated by twist-offs or crooked tubing, which is often the case when a non-technical attempt is made to impose maximum allowable tension, torsion, and combinations thereof.

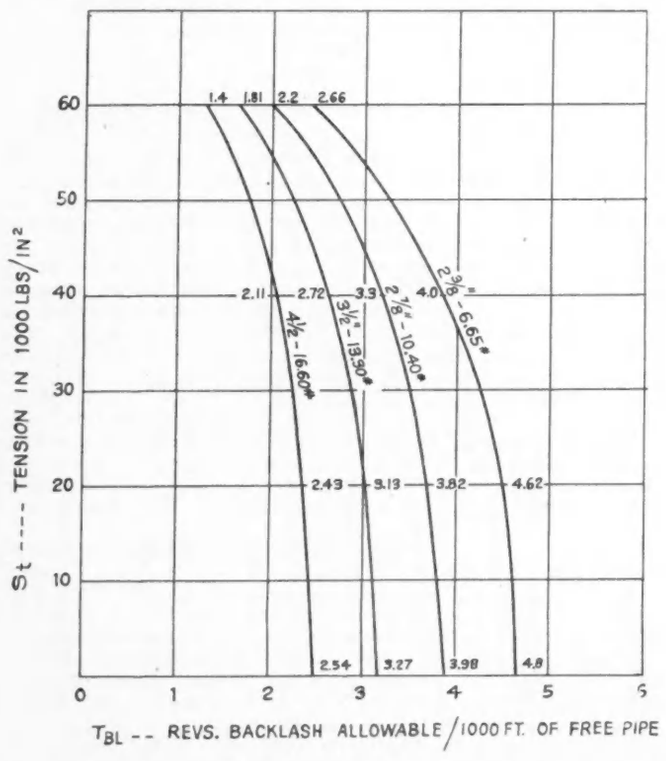

Figure 5. Relationship between imposed tensile stress and the number of turns of backlash allowed per thousand feet of Grade D upset Drill Pipe.

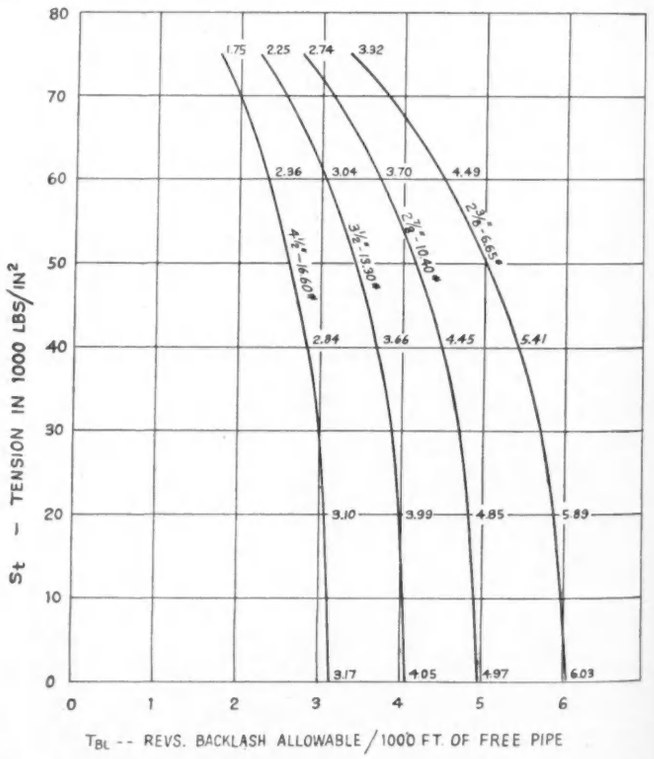

Figure 6. Relationship between imposed tensile stress (S_t) and the number of turns of backlash allowed per thousand feet of Grade E upset Drill Pipe.

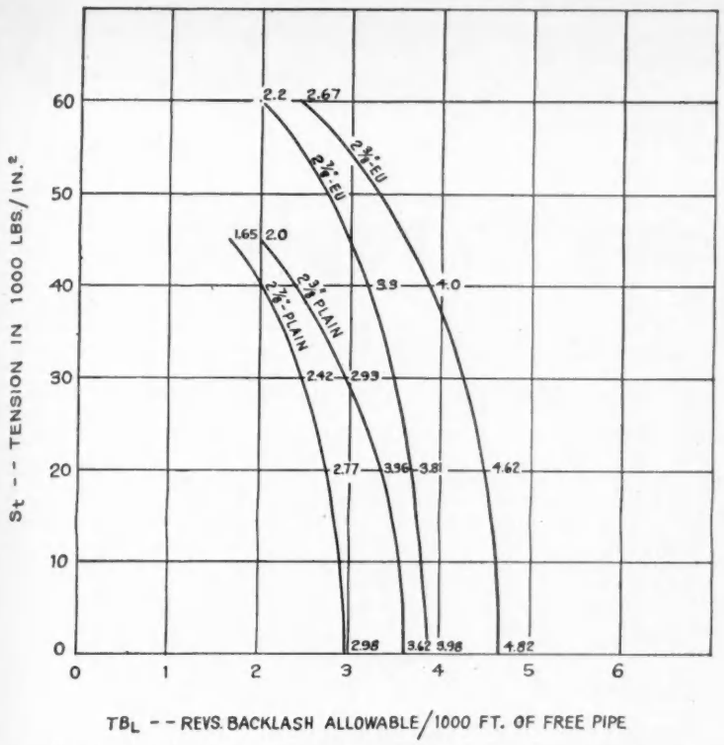

Figure 7. Relationship between imposed tensile stress and the number of turns of backlash allowed per thousand feet of Grade D plain and external upset tubing.

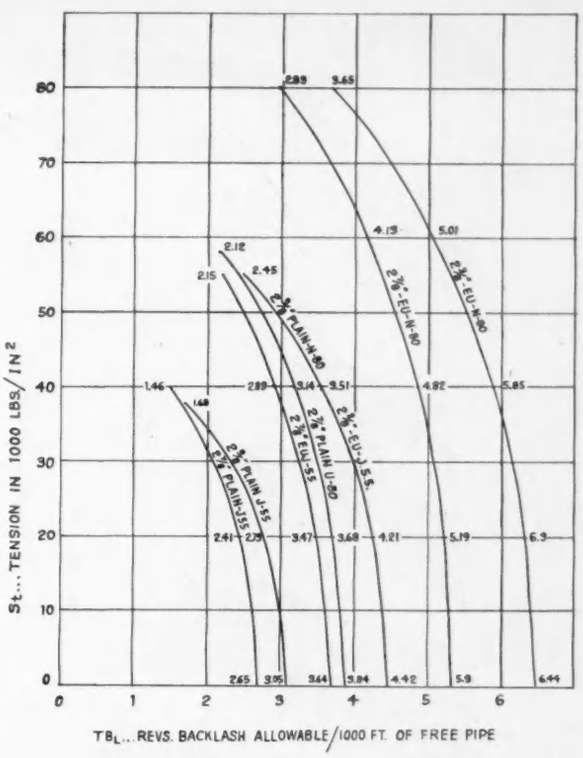

Figure 8. Relationship between imposed tensile stress (S_t) and the number of turns of backlash allowed per thousand feet of plain and external upset J55, and N-80 Tubing.

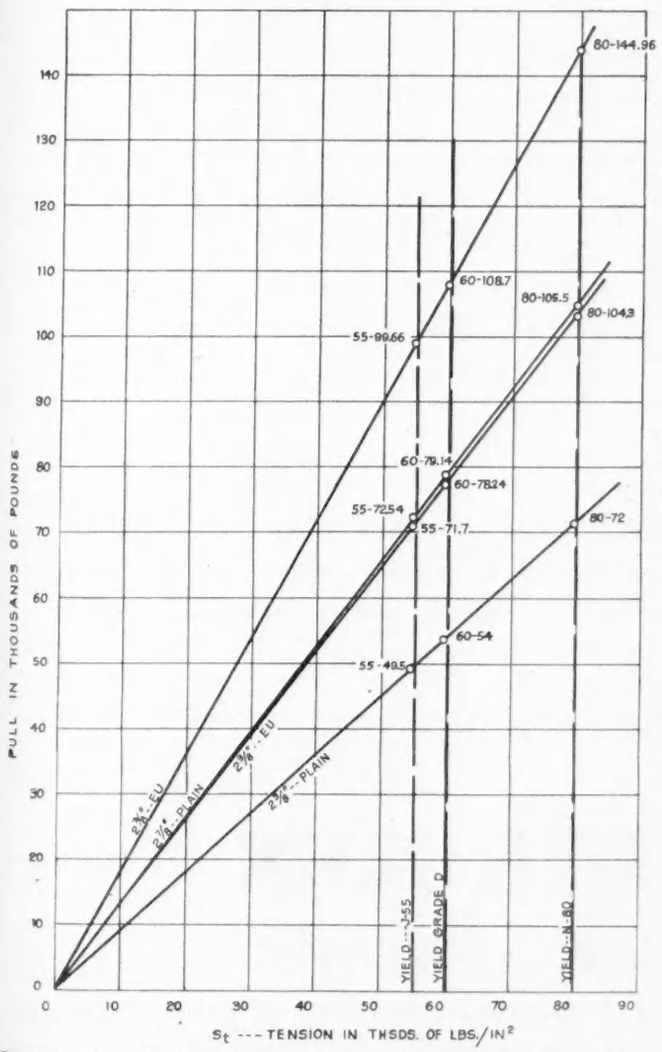

Figure 9. Chart for determining the unit tensile stress (S_t) produced by a total pull on Tubing.

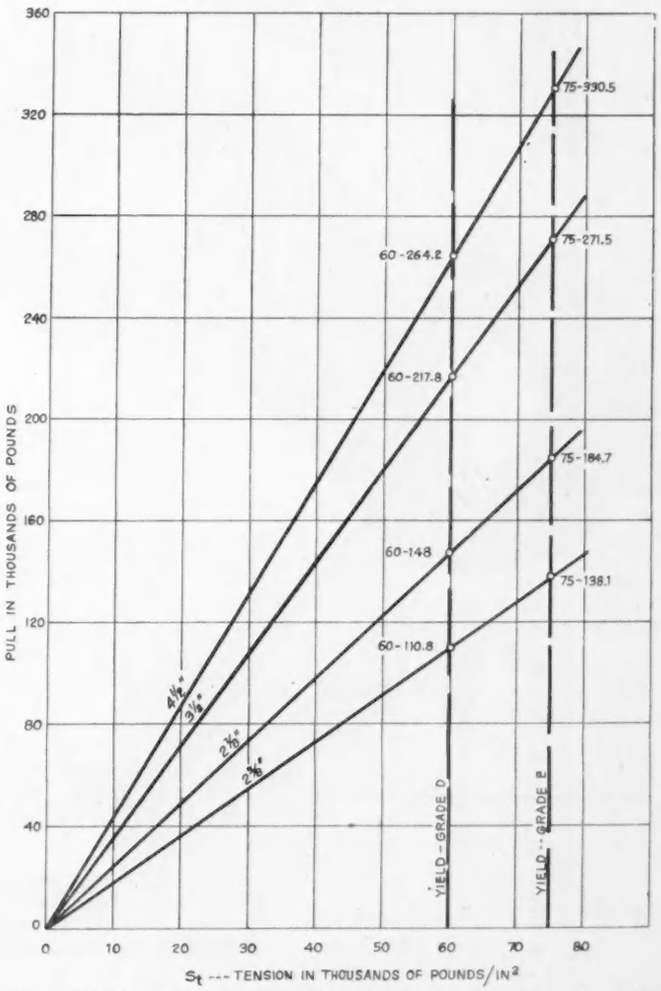

Figure 10. Chart for determining the unit tensile stress (S_t) produced by a total pull on Drill Pipe.

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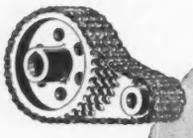

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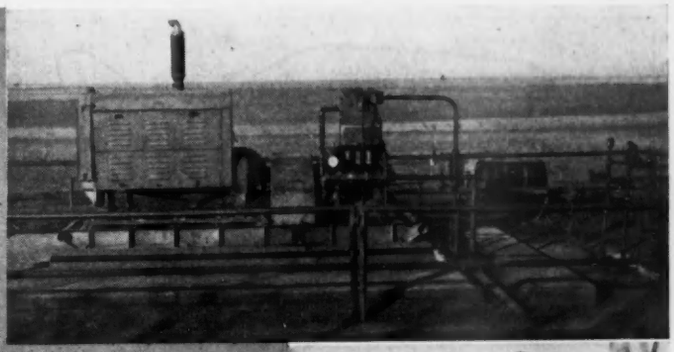
Surface equipment putting up hydraulic pressure for operating 7000-foot well and (below) relatively simple tiein at well head for this type of producing from deep horizons.



SELECTING Artificial Lift EQUIPMENT

By J. H. FIELD
Engineer, Sohio Petroleum Company

THE drilling of oil wells to great depths has added immeasurably to the complexity of problems which confront the operator. In the early days of oil production, the selection of equipment for artificial lift presented no complicated problems, but with wells more than 10,000 feet deep now being produced by artificial means, the selection of producing equipment requires thorough analysis. It is fundamentally an engineering problem.

In preparing an analysis of the factors which determine the method of artificial lift, some knowledge of the producing characteristics of the pool is essential. Usually, this information is available from the reservoir engineers. Without knowledge of the reservoir performance selection of equipment becomes more or less a hit-and-miss procedure. The characteristics of a reservoir may be somewhat diffcult to determine during the early life of a pool as the number of wells is small and their producing history so brief that the available information does not indicate what to expect in the way of reservoir performance in the later life of the pool. For instance, there are some pools which produce water with the completion of the first well and yet it may require months to determine if a water drive is present or if the water produced is interstitial water. In addition, there is the problem of determining how much gas will have to be handled and whether the gas-oil ratio will increase. Many of these factors are not fully known and often have to be predicted on the information available and the performance of similar wells in other areas producing from the same horizon.

It should be emphasized that the ideal time for making an analysis to determine the proper producing equipment is prior to the completion of an operator's first well in the pool. This, of course, is possible in pools only where some other operator has previously completed a well. The reason for making an early study of the conditions for artificial lift, even though the wells may flow for several years, is primarily to determine the size of casing that should be run.

Too frequently operators have decided on a particular casing program, and later, when artificial lifting equipment was installed, it is learned that the casing is too small to permit installation of the proper subsurface equipment. Therefore it becomes advisable to make the initial study of the overall program of drilling and production early in the life of the pool.

Having first determined reservoir characteristics the next step is to determine the method of artificial lift likely to be employed. This may include one of the following:

1. Sucker rods with conventional type pumping unit.
2. Hydraulic system.
3. Submersible centrifugal pump.
4. Flow valves.
5. Sucker rod pump with hydraulic head.
6. Sucker rods with rod-line power.

Each of the methods of artificial lift has certain advantages and disadvantages which will be discussed briefly.

Conventional Type Pumping Unit

The advantages of sucker rod pumping with conventional type pumping unit are as follows:

1. Wide range of speed and length of pumping stroke.
2. Simplicity in the design of equipment. Operation of equipment easily understood by operating personnel.
3. Repair parts usually are available, which minimizes delay in effecting repairs.
4. Operating personnel may determine primary cause for failure of the equipment to produce.
5. Wide range of application, small producers and large capacity wells, shallow and deep wells.

The disadvantages of this method of pumping are as follows:

1. Production in deep wells or in wells producing large amounts of fluid is limited primarily by the ability of the sucker rods to withstand the heavy loading conditions.
2. Sucker rod pumping in extremely crooked holes may lead to excessive rod and tubing failures.
3. The pumper's time required for maintenance of this type of equipment is generally considered greater than that required for other methods of artificial lift.
4. Full-time services of a mechanic usually are required to maintain surface equipment where a number of wells are equipped with conventional type pumping units operated by individual gas engines.
5. When the rod string is long a considerable portion of the stroke imparted at the surface may be dissipated ineffectively in rod stretch.

Hydraulic Method

The hydraulic method of pumping has been widely used for approximately ten years for operation of many different types of wells and for wells more than 10,000 feet deep. It has several advantages over other methods of pumping which include the following:

1. Sucker rods are not necessary and trouble ordinarily encountered in deep wells with heavily loaded rod strings is eliminated.
2. A greater amount of fluid can be handled by the hydraulic method than by sucker rod pumping where large diameter casing is installed.
3. The subsurface pump may be operated over a wide range of speed, permitting flexibility of operation merely by changing the position of the control valve.
4. This method of pumping is adaptable to crooked holes as well as straight holes.
5. A group of wells may be operated

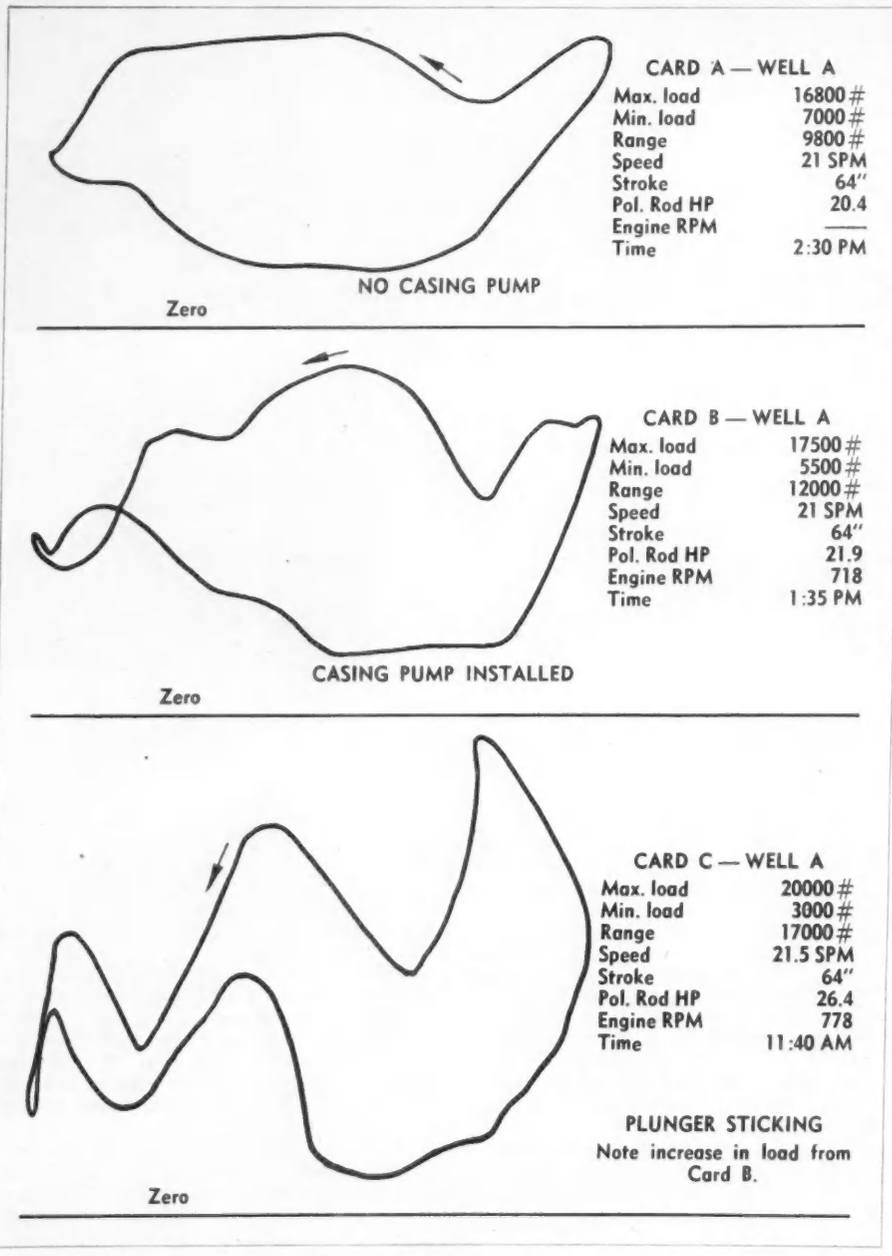


FIGURE 1

from a central point, and under certain conditions only one prime mover is required.

6. The hydraulic method of pumping is efficient. It is not uncommon for the overall efficiency, from the prime mover to the oil in the tank, to amount to as much as 60 percent. The subsurface pump usually has an efficiency greater than 90 percent.

7. The hydraulic system is particularly suitable for inaccessible locations. In areas that occasionally flood, it is not necessary to construct high foundations for the pumping equipment at each well, as is customary when a conventional type pumping unit is installed. Only the hydraulic central power unit need be elevated above flood waters.

8. The ultimate recovery of oil at times is great due to the ability of the hydraulic pump to produce large quantities of fluid and thereby release entrapped oil pockets.

9. A minor advantage in the use of the hydraulic pump lies in the fact that the operating fluid level in the well may be calculated without the use of additional instruments or equipment.

10. The number of surface power units may be increased easily to care for any additional load placed on the system. Also, power units may be removed from the system when not needed, all of which increases the flexibility of operation.

The disadvantages of the hydraulic method of pumping include the following:

1. The corrosive nature of the fluid being produced is quite important with hydraulic pumping and it is believed that corrosion causes the greatest difficulty with this type of equipment. This is obvious when it is considered that not only are there many working parts in the subsurface pump subjected to corrosion, but any product of corrosion, such as iron oxide, acts as an abrasive and is likely to cause severe damage or sticking of the parts.

2. The repair shops for hydraulic units are maintained by the manufacturer and in most cases are located at considerable distance from the field. Thus some delay may occur in getting the pumps repaired plus the additional inconvenience and expense of shipping the pump to the shop. In addition, spare pumps must be available during repairs to any pump pulled.

3. The hydraulic type of pump is generally not fully understood by operating personnel and at times the subsurface unit may be pulled prematurely due to improper analysis.

4. It is imperative that the hydraulic subsurface pump be operated with clean oil. The effects of foreign material entering a precision-type pump are obvious.

5. Any paraffin accumulation between the power string and the production string must be removed occasionally. Frequent paraffin removal may be of major importance in affecting the cost of operation. However, new devices are being perfected for paraffin removal which likely will reduce difficulties from this source. Occasionally a heater is necessary to heat the power oil in an effort to reduce paraffin difficulties.

6. In deep wells, high operating pressures in the subsurface pump may be encountered if a ratio type of pump is used, and failure of pump parts due to high pressure may occur.

7. The cost of repairs to a hydraulic subsurface pump, which is a precision piece of equipment, usually is much higher than for a sucker rod pump operating in the same area.

8. Close supervision must be maintained with hydraulic equipment if low lifting costs are to be expected. Time is required to teach personnel the proper methods of operating the hydraulic units. Often this is reflected in the lifting expense. Some companies have an employee assigned to the task of continually checking hydraulic operations to determine if the pumps are operating at maximum capacity, to check troublesome wells, and to inspect hydraulic pumps when they are removed from a well and also to inspect the pumps as they are repaired in the shop. Accurate and complete records must be kept on the performance of the hydraulic pumps in order that causes of abnormal pump expenses may be detected and corrected.

9. The hydraulic pump is generally considered by the operators not to perform as satisfactorily in wells that pump off as in wells with high fluid levels. This is attributed to the fact that when fluid ceases to fill the production pump on each stroke, there is a tendency for the valves to pound out, and pounding of the pump may cause liners to fail. When light fluid is being pumped the same effects hold true.

Submersible Centrifugal Pump

The electrically operated submersible centrifugal pump is primarily a high capacity pump, and it has the following advantages:

1. In wells 6500 feet deep equipped with seven-inch casing, this pump can produce considerably more fluid than by sucker rod pumping. In water drive areas the centrifugal pump has been known to increase ultimate recovery in wells that have reached their economic limit by other means of pumping. This is attributed to releasing entrapped pockets of oil through a reduction of bottom hole pressure as a result of producing large volumes of fluid.

2. The centrifugal pump has operated satisfactorily in handling corrosive fluids in certain areas where other types of artificial lifting equipment have difficulty.

3. Since the centrifugal pump has an

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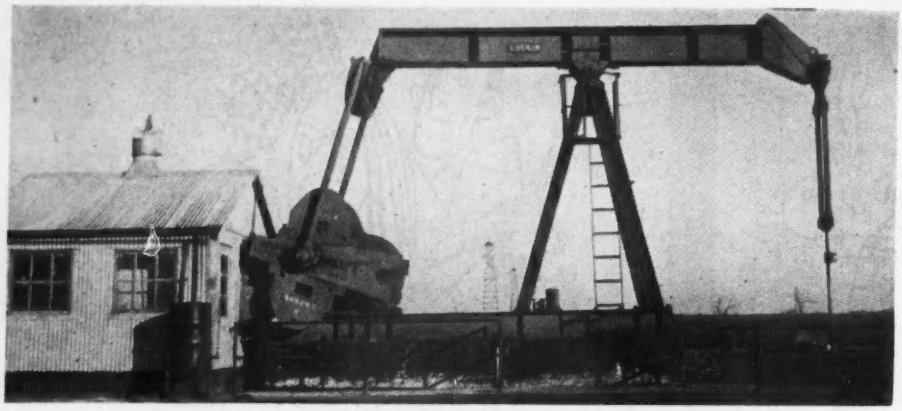

Type of pumping equipment used in 7000-foot production with conventional sucker-rod and down-the-hole pump. High post and long beam permit relatively long stroke with consequent reduction in number of strokes per minute to maintain production.

electric motor as a prime mover, automatic operation is possible, leading to a reduction in operating labor.

The disadvantages of the submersible centrifugal pump are as follows:

1. The centrifugal pump does not have the flexibility of operation inherent in other methods of pumping, inasmuch as the pump cannot be speeded up and slowed down without difficulty.

2. The source of electric power should be reasonably close or else a generating unit must be installed. Portable generating units do not operate satisfactorily for this type of service.

Cost High

The cost of installing an electric distribution line to connect to the utility system often is prohibitive.

3. The overall efficiency of the submersible electric pump may be less than 40 percent with the cost of electric power for operating this type of unit reaching $30 a day when using a 97½-horsepower motor.

4. The repair expense for a submersible centrifugal pump is often high. This is not a disadvantage if long pump life is obtained between repairs jobs.

5. There have been some instances where gas locking of the submersible centrifugal pump has occurred. This, however, likely would not be in wells with high productivity index.

6. This type of pump has not performed satisfactorily in wells producing large quantities of sand, as the sand readily cuts out the pump.

7. There is always danger of the motor burning out due to failure of the fluid seal which restrains the well fluid from entering the motor windings.

Flow Valves

There are several distinct advantages of flow valves for artificial lift which include the following:

1. Flow valve installation is the most economical method of installation of all methods of artificial lift, other than straight gas lift, if high pressure gas is available. The only subsurface equipment required in addition to the tubing string is the flow valves and occasionally a packer.

2. Some flow valves have been known to remain in operation four or five years without having to be pulled and when necessary to repair the valves, charges are of minor importance.

3. The amount of labor required for operation of a large number of wells with flow valves usually is less than that required for operation of the same wells with sucker rod pumps.

4. The cost of operation of flow valves ranges from 10 to 60 percent of the cost of operation by other methods of artificial lift, depending on the cost of high pressure gas.

The disadvantages of flow valves are:

1. High pressure gas is required for successful flow valve operation with few exceptions.

2. The source of gas must be adequate for long-time operation.

3. In some cases it is not possible to deplete a reservoir by flow valve operation and other methods of artificial lift must be used.

4. The amount of fluid that can be produced with flow valves in deep wells is several times that which can be lifted with the sucker rod pump or can be produced with the hydraulic unit, depending on the size of casing and other factors.

5. In any new flow valve installation a certain amount of experimentation usually must be conducted to determine the position of the valves in the tubing string and the most practical operating conditions.

6. A radical change in bottom hole pressure or a change in the percentage of water in the fluid produced sometimes results in operating difficulty of the flow valves.

7. The cost of installation of a high-pressure gas line often involves considerable expense and where there is some question of obtaining satisfactory operation with flow valves the expense of the high-pressure gas line may not be justified.

8. Paraffin accumulation in the tubing may increase the velocity of flow in the tubing due to the decreased diameter which would result in a subsequent change in back pressure on the valves and may cause the flow valves to operate unsatisfactorily.

Hydraulic Head

A recent method of pumping deep wells in with the hydraulic head. The hydraulic head consists of a long cylinder placed directly over the well in a vertical position and fitted with a piston which is connected to the customary sucker rod string. A conventional subsurface pump is employed which is capable of operating with extremely long pumping strokes.

The piston is operated by hydraulic control over a fairly wide range of speeds. The advantage of this particular method of operation over the conventional pumping unit lies in the fact that long strokes, up to 21 feet, may be employed with reduced pumping speed.

The long, slow pumping strokes (six strokes per minute) minimizes the acceleration effect of the rods and thereby decreases the maximum load imposed on the rod string, and with a reduction in the number of stress reversals there are few rod failures. Dynamometer cards taken on the polish rod indicate a perfect work diagram.

This type of unit is being successfully used in 8000-foot wells in California, produced by a 2¼-inch bore pump with production amounting to more than 400 barrels per day with the well being pumped close to bottom.

Installation of a hydraulic jack is planned for a 10,000-foot well using a 1¾-inch bore plunger.

Rod-Line Power

Rod-line powers usually are employed only for relatively shallow wells having limited production, and although this paper primarily concerns deep wells, remarks covering rod line powers are included. The advantages of a rod-line power are as follows:

1. Simplicity of operation with only one prime mover.

2. Usually less pumper labor is required to operate a group of wells with rod-line power than for the same wells employing individual pumping units.

The disadvantages of a rod-line power are as follows:

1. Inefficient transmission of power in rod lines. Friction loss may amount to one horsepower per 1000 feet of rod line.

2. The operating speed of the power is limited by the friction in the rod lines, by harmonic oscillations, and other factors.

3. Rod-line powers are not designed for heavy loading conditions.

4. Usually it is not practical to connect wells more than one-half mile away due to rod-line power losses and maintenance expense of the long lines. However, rod lines as long as a mile have been built.

5. In a pool under development it is difficult to select a location for a power, not knowing the eventual load center.

6. A rod-line power should be balanced at all times. This is often difficult due to changing well loads, changing of hours each well is pumped per day, etc., and if a reasonable balance of the power is not maintained failure of equipment is likely to occur.

7. Long rod lines require frequent lubrication and much time of the pumper.

It is not the intention of this paper to indicate in any manner the method of artificial lift that is more desirable, but to point out the many factors that should be considered in the selection of producing equipment. It is firmly believed that each method of artificial lift is better adapted to certain well conditions than any other method.

The equipment selected for artificial

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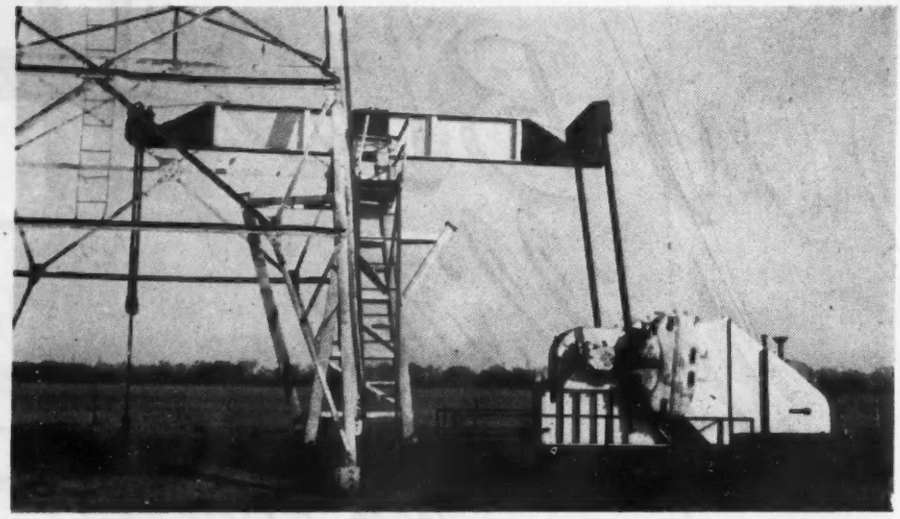


Another type of surface equipment for rod pumping of 7000-foot well. This unit illustrates the large amount of counterbalance required to offset the weight of the long sucker rod string—a factor of increasing importance as rod lines are lengthened and increased in diameter.

lift should be that which produces the required amount of fluid at the least cost with a minimum of operating difficulties. The amount of the initial investment does not necessarily have any bearing on operating expense and the most expensive equipment may present the greatest operating difficulties.

The difficulties in operation of the various types of equipment for any new pool have to be assumed, based on the performance of similar equipment in other pools, and with allowances for conditions peculiar to the pool in question.

One point should be made clear; one particular method of artificial lift may be the most economical during the flush production period and some other method of artificial lift may be more economical during the later life of the wells. This is due to the changing reservoir characteristics, including a lowering of fluid levels, an increase in water production, a change in gas-oil ratio, etc.

It then becomes a matter of opinion whether the producing equipment which should be installed is that which results in the greatest net profits over the life of the pool, even though the production of oil during some portion of that time is less than that which would be produced by some other method of artificial lift. Operators generally do not like to install expensive pumping equipment and a few years later replace that equipment with some other type. Yet, there are numerous instances where a change in method of artificial lift is economically sound. Therefore, the overall picture must be considered in any analysis.

In order to determine the most economical method of artificial lift it is well to consider the following factors:

a. Initial investment.

b. Operating expense of equipment.

c. Salvage value of equipment.

d. Economic life of the wells.

It is difficult to say which of these factors is most important. Factors important in one pool may be secondary elsewhere.

For purposes of comparison it is suggested that a table be prepared for each method of artificial lift showing the amount of investment, the operating expense over the life of the well, and the net cost of installation and operation after the salvage value of the equipment is deducted.

The life of the wells is an important factor affecting equipment selection. Wells that are expected to produce for only a short period of time most certainly would not be equipped with machinery which would not have a high salvage value. For example, wells expected to produce only a matter of months would not ordinarily be equipped with engines requiring large concrete foundations.

In the selection of equipment, proration is another factor which cannot be overlooked. If proration be non-existent it may be advisable to install large capacity equipment and produce the wells at high rates, which will tend to reduce the length of time that the wells must be operated to deplete the reservoir.

If proration exists, the equipment likely should be selected to handle the current allowable, taking full cognizance of the fact that the allowable may be increased later.

Often the equipment in warehouse stock is another factor influencing equipment selection. Installation of equipment on hand is occasionally made, even though cost of its operation may be slightly greater than the operating expense of new equipment.

In this respect, it is well to point out that a careful analysis should be made before any equipment on hand is installed if it is not exactly the type of equipment which would be selected if purchased new. Sometimes the management will be concerned chiefly with the amount of investment and give little consideration to operating expenditures and possible trouble in operation of equipment on hand leading to false economy.

After calculations have been made regarding the particular equipment to be used for producing wells, there is another important factor which has to do with company policy. The managements of some companies have made repeated statements that large equipment always should be installed where there is any question of doubt. It is pointed out that in the long run such a program pays dividends for many times the magnitude of the loads to be handled will be much greater than anticipated due to water encroachment, etc., and large equipment can be universally employed.

There are other companies which attempt to hold investment to a minimum and after calculations are made indicating that a particular piece of equipment should be used, the next smaller size of equipment is purchased. The theory is held that all equipment is over-rated and that the material will withstand much greater loads than those recommended by the manufacturer. Contrary to this theory records over a period of years have indicated that repair costs are much greater for those units which are operated beyond the manufacturer's rating. Also, numerous examples can be cited where the equipment installed had to be replaced because it was later found too small.

Selection of Subsurface Equipment

Perhaps more than 90 percent of all wells produced by artificial methods are operated by sucker rod pumps. Some of the factors involved in the selection of subsurface equipment for this type of pumping are reviewed.

The procedure for the selection of equipment for sucker rod pumping is first to determine the bore of pump necessary to produce the required amount of fluid using a pump efficiency of approximately 75 percent for most wells. Knowing the bore of the pump and the maximum fluid production to be handled per day, the peak polished rod load is determined based on Mills formula as follows:

$$P = W_o + W_r \left(1 + \frac{LN^2}{70{,}500} \right)$$

Where:

P = Polish rod load pounds.
W_o = Weight of fluid pounds.
W_r = Dry weight of rods.
L = Length of strokes in inches.
N = Number of strokes in inches.

If there are other pumping wells in the pool, the maximum polished rod load may be determined by dynamometer tests. However, it should be fully understood that dynamometer tests are meaningless as far as equipment selection for other wells are concerned unless the wells being weighed are operating under maximum conditions.

In the design of any steel structure an ample safety factor usually is employed, but this is not so with the design of sucker rod strings. Sucker rod strings are selected on the endurance value of the rods as determined by laboratory tests and no safety factor is involved. Consequently, frequent failure of rods operating under heavy loading conditions may be expected.

In some areas sucker rod expense will average over $600 per well per year, or nearly $1.65 per day. Sucker rod repairs frequently account for a major portion of the total lease operating expense. Therefore, it is profitable to purchase a better grade of rod for severe loading. There is no question that better-grade rods reduce maintenance expense for heavily loaded rod strings. The maintenance expense of sucker rods clearly indicates that the problem of keeping rod strings together rests with the pumpers, foremen and engineers.

The question of better sucker rods is often discussed. Metallurgists tell us that it is possible to increase the ultimate strength of sucker rods by the addition of certain alloys. However, any increase

in the ultimate strength of the rods may affect some other property of the steel. For instance, should the ultimate strength be increased, the rod may lose some of its ductility and would not be expected to withstand the repeated stress reversals as do present rods. Research by the various rod manufacturers has indicated that the physical properties of a rod may be increased through a cold working process such as shot peening.

Several manufacturers of sucker rods are experimenting with nickel alloy rods for use in corrosive wells. This type of rod in all likelihood will not be used extensively because of its high cost, some six times greater than the present best grade of sucker rods. The nickel rods would have to last several times longer than the present best grade of rod to establish them as more economical to operate

Other experiments on sucker rods are being conducted using a plastic coating on the rods in an effort to protect the rods against corrosion. Also nickel-plated rods have been used with success. Nickel-plated rods cost approximately thrice 4620 rods.

Large diameter sucker rods, with a diameter of 1⅛-inch, have been used as a measure to reduce rod failures. The reason for the slow acceptance of the large rods lies in the fact that they are difficult to handle during well servicing operations. Moreover, the large rods can be run only in three-inch or larger tubing, indicating that the hole should be equipped with casing larger than 5½-inch outside diameter. Manufacturers have been reluctant to take orders for 1⅛-inch rods unless carload lots are purchased, due to the difficulties involved in the manufacture of small quantities.

Sucker rod selection is on the basis of the maximum load to be handled and on the corrosive nature of the fluid produced. In areas where a portion of the wells pump corrosive fluid, some operators have adopted the policy of using only one grade of rod in that area rather than using a particular rod for corrosive wells and a second type rod for the non-corrosive wells. The point in favor of using only one type rod in an area is obvious when it is realized that any mixing of rods may result in excessive rod failure. Perhaps the determining factor in deciding whether one type of rod or two or more should be used in one locality is the number of wells requiring each type of rod. Of course, it is realized that the alloy type of rod may cost as much as 25 percent more than the next lower grade of rod.

In the selection of sucker rods for deep wells the decision must be made on what size rods are to be used and if a tapered string should be run. If a tapered string is employed it is the belief of some that any failure of the rods near the top of the string would result in corkscrewing of the smaller diameter rods at the bottom of the well. It has been found from experience that there is no answer to whether rods will corkscrew if the string fails near the top, but it is a known fact that the corkscrewing of rods will, to a certain degree, be dependent on the size of tubing. For instance, if a tapered rod string of 1 inch, ⅞ inch, and ¾ inch rods be run in 2½ inch tubing, it is not likely that corkscrewing of the rods will occur to any large extent, and if three-inch tubing be run for the same rod string the chances for damage to the rods when failure occurs increases.

In an effort to reduce the damage to rods following failure, some operators are following the practice of using oversize couplings for the smaller diameter rods with much success. In this respect, the couplings that normally would be used for ⅞-inch rods are, at the time of manufacture, drilled and tapped for the ¾-inch rods. In addition to the possibility of decreasing the damage to rods when they part, the large couplings also serve to increase the life of couplings because of larger wearing surface and higher fatigue value than the normal-size couplings.

One factor to be considered in the selection of rod strings for shallow wells is rod cost. Calculation may indicate that ⅝-inch rods could be used in 2500-foot wells producing less than 100 barrels per day, but a number of operators prefer to run ¾-inch rods because the ¾-inch rod in the carbon-grade would cost only $75 more per well than the ⅝-inch rods, and this difference is small compared to the additional safety factor gained.

If a balanced rod string is selected, length of each section of rods in the string is determined by the manufacturer's recommendation for balanced strings which is based on a mathematical formula, and it is assumed that the unit stress is the same for the top rod in each section. In many cases of rod selection the larger rods are run to a depth of several hundred feet below that indicated by the selection tables. This is done to increase the stiffness of the rods at desired points and to increase the safety factor at the top of each section of the rods.

Selection of Subsurface Pump

The selection of sub-surface pump for sucker rod pumping should be made first, on the amount of fluid to be produced; second, on the type of fluid being handled, that is, whether it is corrosive, contains sand, gas, etc., and; third, on the depth of the well.

In selecting a pump for any given well, the usual procedure is to determine the pump displacement using the established volumetric pump efficiency. Knowing the maximum length of stroke on the pumping unit, the bore of the pump necessary to provide this displacement may be calculated.

There are two general classifications of pumps. One is the rod pump which is an insert pump run on the rods, and the other is the tubing pump which is run on the bottom of the tubing. Today, especially for deep wells, only rod pumps are considered, and only rod pumps will be included in this discussion. The rod type of pump is manufactured with and without liners in the pump jacket.

Each type of pump has a particular application. In wells that produce large amounts of sand, a top anchor pump usually is run to reduce the difficulty with stuck pumps when pulling. Also, a top anchor pump is run in wells having low fluid levels to pump the well near bottom.

Liner pump: The liner tpe of pump is used in deep wells in which the working pressure is high and where small clearances between the plunger and liner are necessary to prevent slippage. The liner type is also used in corrosive areas where the type of liner may be selected for a particular corrosive condition.

The liner pump usually has liners the full length of the jacket, but there are modifications of this type of pump and some pumps only have from two to four liners. The two-liner type of pump is not particularly adaptable to wells which produce considerable quantities of gas, due to the large space between valves where the gas may be compressed. This type of pump is not suitable for deep wells but is satisfactory for shallow production.

Full working barrel pump: The type of pump employing a cold-drawn barrel with a metal plunger has a greater pump displacement for a given size of tubing than the liner type of pump, and therefore is used in wells where large columns of fluid are produced. It is not particularly adapted to deep wells due to the fact that the barrel has a tendency to increase in diameter under high pressure, thereby increasing slippage in the pump.

Cup-type pump: A cup-type plunger is usually run inside a cold-drawn barrel. This pump has the same advantages of volume displacement as the pump with metal plunger in a cold-drawn barrel. However, cups do not operate satisfactorily in wells producing large quantities of sand as the sand has a tendency to cut out the cups and also to lodge in the cups and score the barrel.

A cup-type pump generally is not suitable for deep wells because pressure on the cups will cause them to turn unless many cups are used. If a plunger has many cups, the friction of the cups

About The Author

J. H. FIELD graduated from the University of Illinois in 1933 with a B.S. degree in engineering and the following year joined Gulf Oil Corporation for service in Venezuela as a student engineer. He returned to the U. S. in 1937 and transferred to the Gypsy Division of Gulf, holding various positions in the field in engineering work and also spending three years in the company's Tulsa office in the mechanical engineering department, where he attained the position of district superintendent. He resigned in 1945 to join Sohio Petroleum Company as head of the mechanical engineering department. He is on the general office staff covering operations in ten states and is presently located in Oklahoma City. He is active in the ASME and the API and is past president and organizer of the Oklahoma Society of Petroleum Engineers.

against the pump barrel is high and will increase the load on the rod string which may lead to failure of the rods. The cup pump is used extensively in stripper areas.

Ring-type pump: The ring-type plunger operating in a cold-drawn tube has been successfully used in wells producing sand and large amounts of water. The difficulty with this type of pump is in getting the proper fit of the rings in the barrel. Also, if the rings fit too snugly, the rod load may be considerably increased.

Traveling and stationary plungers: There is a traveling plunger pump and also a stationary plunger pump. The traveling plunger pump is considered more efficient due to a larger standing valve being used for a given size of tubing. The stationary plunger pump has advantages in wells producing sand due to the upper valve keeping any floating sand from settling in the pump, especially if the well is shut down temporarily.

There has been much discussion on the amount of clearance between the plunger and barrel in a pump. Some manufacturers recommend plunger clearance of .002-inch for all sizes of pumps in order to reduce slippage to a minimum. A few operators claim that the plunger has a tendency to stick if small clearances are used. This, however, will depend on the temperature coefficient of expansion of the metals used in the pump. The largest clearance that a repaired pump should have for satisfactory operation is considered to be .004 inch.

Casing pumps: There is being manufactured a device known as a casing pump which is run without tubing. For general consideration, it is a packer with a seating device for a pump. Of course, the main advantage in using casing pumps is that tubing is not necessary. A regular type insert pump, the same as would be run with tubing, may be used.

One consideration in the use of a casing pump is that it is not necessary to purchase large tubing if the present tubing is too small to accommodate a large bore pump. This is quite an important factor in marginal wells where the revenue from the well is insufficient to offset the additional investment. Also, in areas where the tubing is corroded and requires replacement, the marginal well may continue operation if a casing pump be run. The tubing is usually run back into the hole and used as a guide for the rod string.

In order to determine whether there is any decrease in load and horsepower requirements for a well following the installation of a casing type pump, a test was conducted on a 4800-foot well, and dynamometer cards were obtained before and after installation of the casing pump. The pumps used in the tests were identical, and as far as possible, all operating conditions of the well were held the same.

Although the installation of casing pumps in a number of instances has resulted in a reduction of polish rod load and horsepower it will be noted on the attached cards (Figure 1) that the maximum rod load as well as the polish load horsepower was approximately the same in each test. One point worth mentioning is that at the time the dynamometer cards were being taken the pump plunger had a tendency to stick, and therefore it was possible to obtain a card while the plunger was sticking as well as when the plunger was free. It will be noted that sticking of the plunger resulted in an additional well load of 1900 pounds and that the stress range in the rods was 16,400 pounds as compared with 14,100 pounds when the plunger was free. The polish load horsepower increased 1.5 percent as a result of the plunger sticking.

This is an example of what happens when some pumps begin to fail and the cause of the rod failure can often be attributed to failure of the pump. It is obvious that many rods which are operating at maximum conditions fail due to unusual loading conditions such as sticking of the pump, accumulation of paraffin in the tubing, etc.

Tubing Catchers

Tubing catchers have been used for many years in an effort to reduce the amount of tubing trouble. There is some controversy whether tubing catchers should be run, for in many cases fishing jobs have occurred as a result of inability to remove the catcher. In deep well pumping, especially where maximum pumping cycles are employed, it has been found that tubing catchers are essential. Otherwise, tubing failures would be excessive.

To keep tubing catchers from moving up the hole and also to have the correct amount of weight on the slips, a procedure of releasing from 2000 to 4000 pounds of weight on the catcher has proved satisfactory.

Standardization

The need for standardization of producing equipment in any one area cannot be overstressed. Not only is the appearance of the property improved if all units are the same, but the repair situation is bettered if parts of one unit can be transferred to another. Especially is this true if a high capacity well is down because of mechanical trouble and parts of a unit on a small well can be transferred to the unit on the larger well. Moreover, the number of different units and prime movers which the pumper must be familiar with is minimized through standardization. Of course, it is not always practical to place identical equipment on all wells in the same pool due to different rates of production, but where a standardization program can be carried out, it certainly would be advantageous. There are a number of instances where as many as eight different sizes and types of engines were employed on 25 wells in one area. Needless to say, stocking of parts for these engines was a problem during the war period.

Operation of Equipment

Though this paper deals primarily with the selection of equipment, a few remarks regarding the operation of such equipment appear apropos.

In order to have the most economical operation with sucker rod pumping over the life of the wells, a certain policy should likely be adopted by the company for replacement of sections of rod strings after frequent failure. The sucker rod replacement policy should be firmly established in order that the men in the field may replace rod strings without having to make an analysis of rod failures following each parting of a rod string.

A company's sucker rod replacement policy should likely be of a general nature and should possibly include such statements as the following:

1. All new rods placed in a string should be installed at the top of the section of that particular size of rod.

This will place maximum load on the newest rod.

2. Any pony rods installed should be of the identical grade of rod used in the remainder of the string.

There are many times when a string of rods is sent to a well with an insufficient number of pony rods, or else no pony rods have been delivered. In such cases it is up to the supervisor of the job to obtain pony rods, and used pony rods or rods of a different type may be used to expedite getting the well on production. This procedure is highly objectionable and in nearly every case results in failure of the rod string that would not have occurred if the proper grade of rod had been installed. Moreover, the contractor's servicing crews when in need of a rod often will use the first rod available, unaware that an inferior grade will result in premature rod failure with subsequent downtime of a well.

3. A section of rod should be replaced when a certain number of failures occur within a given time period.

For instance, some companies hold that a rod section should be replaced when rod failures exceed three per month, not including unscrew jobs and rod coupling failures.

4. Polished rods are to be used in accordance with American Petroleum Institute specifications.

Often a polish rod will be used which has a smaller diameter thread than that recommended by API for a particular diameter of sucker rod. Many operators are not aware of API specifications and failure of the polished rod has been attributed to too small a thread diameter at the bottom of the polished rod.

5. Rod couplings should be replaced when three coupling failures occur in any month.

Unscrewed rods and rod failures at the pins are usually traceable to unsatisfactory makeup.

Conclusion

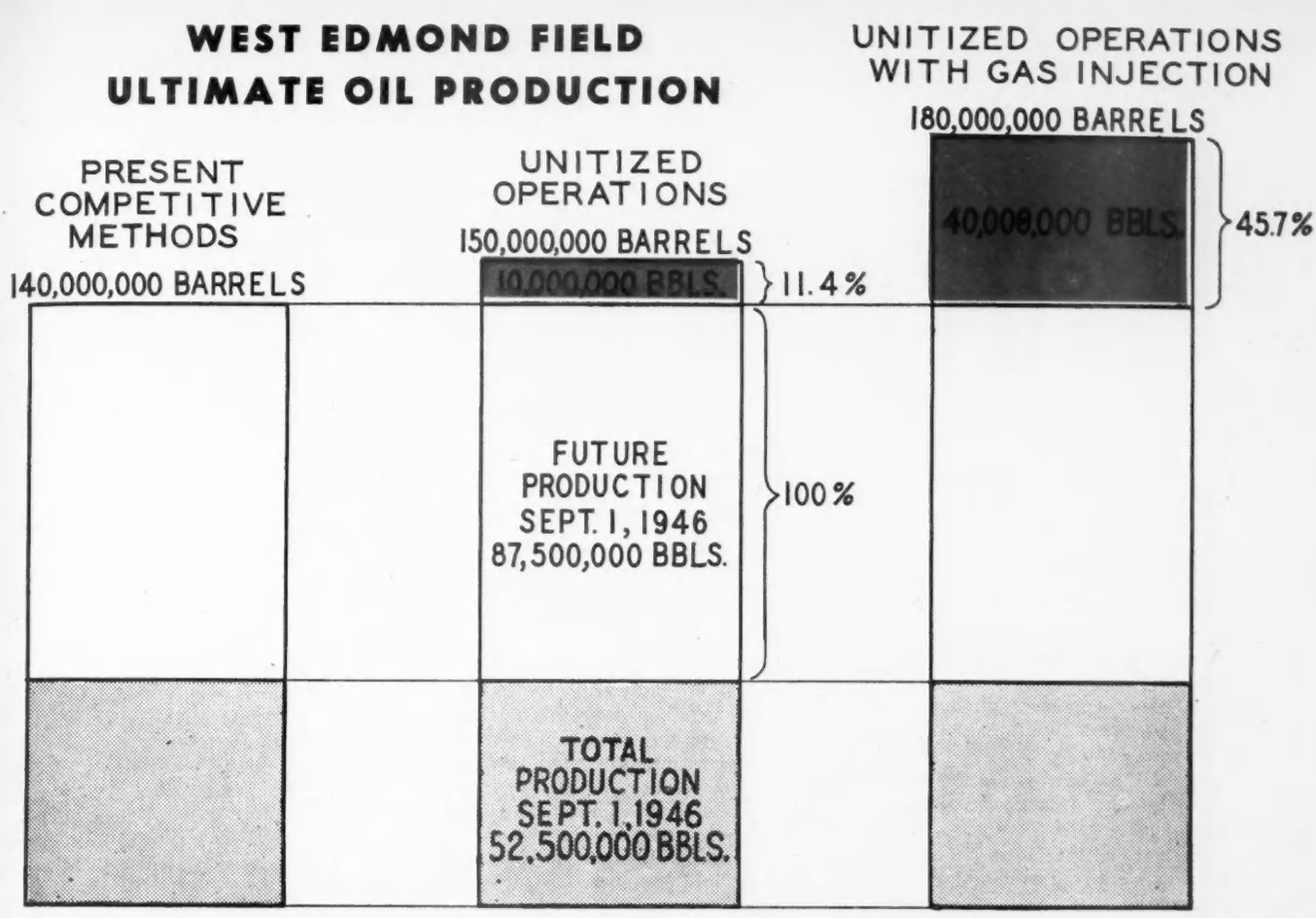
In conclusion, it is reiterated that the selection of equipment for artificial lift is an engineering problem and all factors including reservoir performance should be analyzed before equipment is selected.

The engineering analysis should include an investigation of the advantages and disadvantages of each method of operation. It should include the amount of initial investment and the cost of operation of the equipment over the life of the pool.

Proration, equipment on hand, and company policy are some of the other factors to be considered. The correct selection of subsurface equipment for sucker rod pumping has a decided effect on operating expense.

Not only is it an engineering problem to select equipment for artificial lift, but it is also an equal engineering problem to investigate high operating expense following installation.

Many independent operators may not be in position to have a well rounded engineering organization and must rely on the services of an engineering firm engaged in well trouble analysis work. The need for a continual study of equipment failures cannot be overstressed.



Possible Unitization Gains For West Edmond

THE West Edmond Hunton-lime field in Oklahoma's Canadian, Kingfisher, and Logan counties is a major source of crude in the Mid-Continent region. As of the first of 1947, there were about 735 wells in the field producing from the Hunton lime at a depth of approximately 7000 feet. These wells have proved 29,400 acres to be oil productive.

A recent, exhaustive study by engineers and geologists resulted in the conclusion that the field, which produces without an adequate natural water drive, originally contained approximately 600 million barrels of oil, of which 140 million barrels can be recovered under present methods of operations. Approximately 52½ million barrels had been produced as of September 1, 1946.

The study revealed that a substantially greater quantity of oil can be produced if methods of operation which will conserve the reservoir energy are used. This will be possible only if the field is unitized. There are two such methods:

A. Selective production of wells.

B. Pressure maintenance by return of gas to reservoir.

Unitization will immediately permit the selective production of wells. This will result in a substantial reduction in the daily gas production, and at the same time the daily oil production from the field either will be maintained at its present level or increased. Engineers and geologists believe that by selective production methods an additional 10 million barrels of oil will be recovered. Such would represent an increase of 11.4 percent above the 87½ million barrels of oil yet recoverable by present methods of production.

As soon as practical after unitization, facilities for injecting gas will be installed to permit observation of the actual performance of several portions of the field with gas injection. The operators will spend nearly $500,000 on this test program. If such a program indicates that gas injection will increase recovery from the reservoir the operators will then determine the extent of the gas injection project. It is the majority opinion of the engineers and geologists that field-wide gas injection, if it can be controlled satisfactorily, will increase the production of the field to 180 million barrels of oil. Some engineers and geologists, how-

THE West Edmond oil pool of central Oklahoma was the only major oil pool discovered during the war with reserves in excess of 100 million barrels. Since shortly after its discovery petroleum engineers have recommended unitized operation to conserve reservoir energy and prolong the life of the pool. Success or failure of such a plan will influence individual lease and royalty owners in other large areas where such operation may be proposed. The following article favoring unitization is a consolidation of an engineering report by the Engineering Geological Subcommittee operating under the direction of the West Edmond Operators' Steering Committee.

ever, believe such a figure to be conservative and estimate that an ultimate recovery of 220 million barrels of oil may be obtained through unitization and gas injection. These represent a total increase of 40 million barrels, or possibly 80 million barrels, over present methods of operations. Such improvement in oil production would reflect an increase of 5 million, or possibly 10 million barrels, in increased royalty if the royalty interest is one-eighth. The 40 million and 5 million figures represent an increase of 45.7 percent in ultimate production and royalty above that which would be obtained in the future through present methods of operation.

Increased Revenue from Casinghead Gas

The operators of the field are negotiating a contract with the owners of the gasoline plants. The new contract will be effective after the field is unitized. Under the present contract between the operators and the gasoline plant owners the royalty owners receive ⅛ of 50 percent of the gross revenue from gas sales. Under the new contract the royalty owners will receive ⅛ of 100 percent of the gross revenue from gas sales and in addition will receive a greater portion of the gasoline and other liquids recovered from the produced gas.

Unitization will make possible the saving and processing of large quantities of gas now being vented to the air.

Under unitization, therefore, the royalty owners will enjoy a substantial increase in revenue from casinghead gas for three reasons: (1), More favorable contracts with the gasoline plants; (2), increased recovery of liquids; (3), more gas sold.

It is well known that West Edmond is being rapidly depleted. Continuation of the present rate of depletion will result in premature abandonment of operations. Unitization will prolong the economic life of the field by the conservation of reservoir energy and reduction in operating costs. It has been estimated that without unitization approximately 25 percent of the total wells in the pool will have been abandoned by 1952, and that by that time all producing wells will have been placed on the pump. By the end of 1957 all wells will have been abandoned. With unitization, the oil-producing life may be extended to 1959 or longer. With a gas injection program, the producing life of the field should extend to 1965 or longer.

The daily rate of oil production from the field will eventually decline, no matter what method of operation is employed. Under unitization, however, higher production rates can be maintained than are possible otherwise.

Participation In the Unit

When a field such as West Edmond is developed and unitization is not employed, each royalty owner receives a fixed percentage of the money which accrues from the sale of oil, gas, and liquefiable products produced from his particular property. When the production of these hydrocarbons becomes no longer profitable, the lease is abandoned. With unitization, every royalty owner receives a fixed percentage of the revenue from the entire field. The share which each royalty owner in West Edmond will receive of the total oil, gas, and liquefiable products will be determined by a formula based upon measurable engineering factors recognized by both the Oklahoma Corporation Commission and the West Edmond operators. By the use of this formula, percentages applicable to each producing well have been computed and the royalty owner who participates in this unitization project will receive this fixed percentage of all production from the unit area until the last well becomes unprofitable to produce. The factors considered in the above mentioned formula include acreage, thickness of pay section, bottom-hole pressure, gas oil ratio, and productivity, all weighed so that each lease will receive in revenue the same proportion of future discovery that the lease would receive under present methods of operation. Examples of the possible future of a Tract "A" (a fictitious property) under the three possible methods of operation are presented in Table 1.

Proposed Method of Participation

The formula for determining the percentage participation of each well is:

$$100 \left[\frac{\text{Daily Well Allowable}}{\text{½ Daily Field Allowable}} + \frac{\text{Feet} \times \text{Bottom Hole Pressure of Well}}{\text{½ sum of (feet} \times \text{weighted bottom hole pressures)}} \right]$$

Where feet is the thickness of the Bois d'Arc plus the productive thickness of the Lower Hunton.

The advantage and benefits discussed above can accrue to the royalty owners only as a result of unitized operation of the field. Although the entire cost of unitization and gas injection will be paid by the operators, the royalty owners will share in the benefits.

Need for Unitization

The 735 wells of the West Edmond Hunton Lime field are owned by 32 different operators. The 29,400 acres of the pool are divided into 305 leases ranging in size from 40 to 320 acres. Such a large diversity of lease and operating interests permits only a highly competitive, non-efficient type of operation. Existing proration rules control production in as equitable a manner as can be devised but they do not eliminate competition. Therefore, unitization is needed for the following reasons:

1. To permit selective production and the efficient utilization of the native underground energy of the reservoir to the ultimate benefit of operating and royalty interests through the increase of oil production and the conservation of gas. With the conservation of gas which normally would be flared under competitive operations, the existing casinghead gas contracts will be amended to permit a more favorable return to the lease operators and royalty owners, since more gas is available for processing and the plant will have a longer profitable life.

2. To permit the initiation of a gas injection program. Independent gas injection, if attempted, would result in movement of oil and gas across lease lines to the disadvantage of those returning gas to the reservoir. Unitization will permit the installation of an overall injection pattern.

An analysis of the possible methods under which the West Edmond field may be operated in the future definitely indicates the need for unitization.

TABLE 1

Possible Futures of Tract "A"

	Present Competitive Methods	Unitization	Unitization With Gas Injection
Ultimate Production—Total Field—Barrels	140,000,000	150,000,000	180,000,000
Total Production—Total Field, Sept. 1, 1946—Barrels	52,500,000	52,500,000	52,500,000
Future Production—Total Field, Sept. 1, 1946—Barrels	87,500,000	97,500,000	127,500,000
Future Production—Tract "A" (160 Acres)—Barrels	480,000	535,000	699,000
Future Royalty—Tract "A"—Barrels	60,000	66,800	87,300
Tract "A"'s percent of Field's Future Production	0.548%	0.548%	0.548%
Increased Future Oil Royalty—Tract "A"—Barrels	.....	6,800	27,300
Value of Increased Oil Royalty at $1.615 per Barrel (Tax Deducted)	.....	$11,000	$44,000

Cycling Plant Products Set for NGAA Discussion

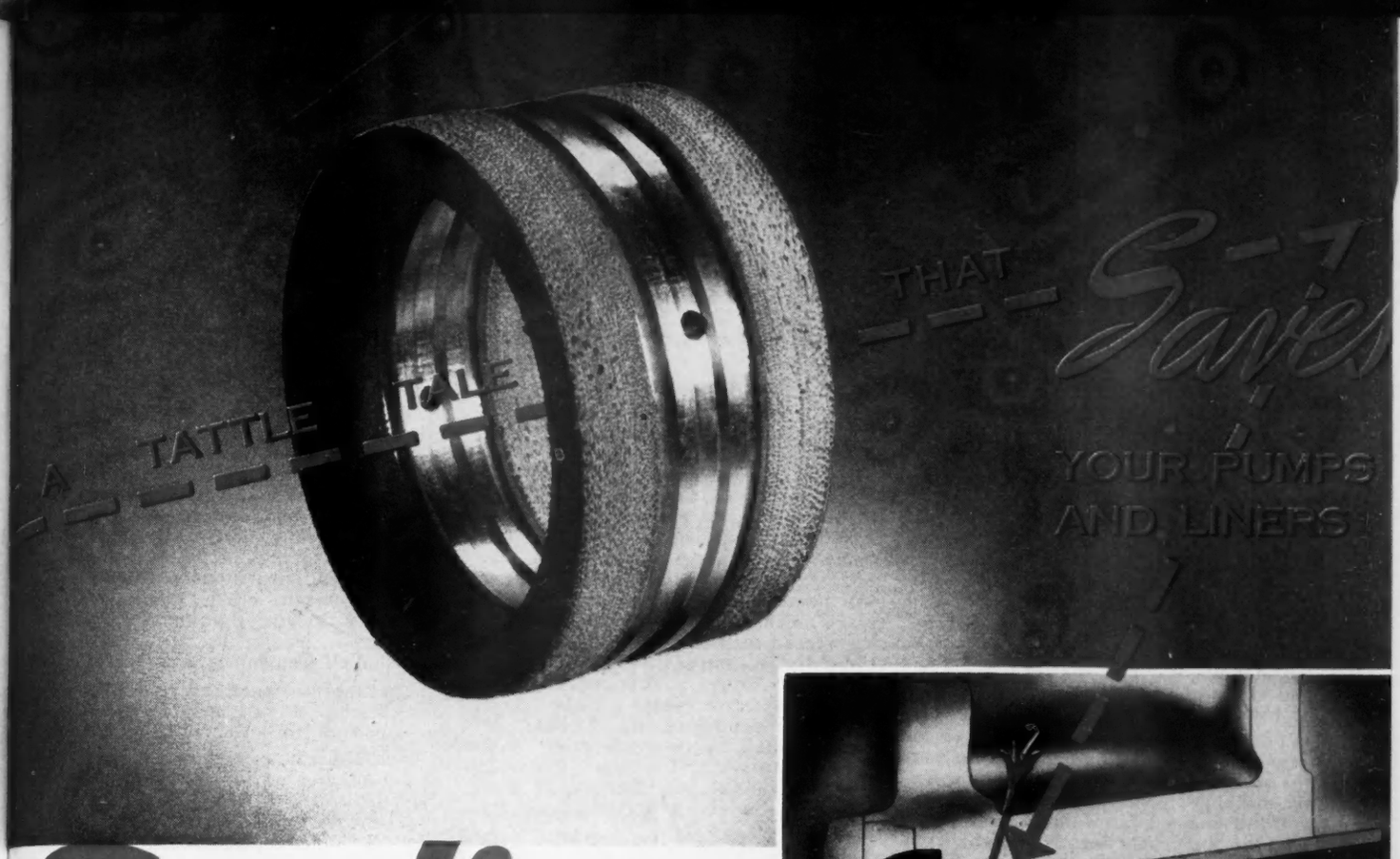
The probable position of products of natural gasoline and cycling plants with reference to future motor fuel markets will be discussed fully at the annual meeting of the Natural Gasoline Association of America to be held at the Baker hotel in Dallas, April 23-25.

Papers on how these products may best fit into the exacting fuel requirement trends, will be presented by W. S. James, auto research department, Ford Motor Company; W. M. Holaday, director of laboratories, Socony-Vacuum Oil Company, and G. G. Oberfell and R. C. Alden, both of Phillips Petroleum Company.

E. O. Thompson, chairman of the Texas Railroad Commission, will discuss the relationship to petroleum conservation of excessive cracking to obtain high octane motor fuels. K. C. Bottenberg, Phillips Petroleum Company, will report on recent winter volatility road tests sponsored by NGAA.

Papers discussing cycling operations will be presented by T. S. Bacon, Lone Star Gas Company; H. L. Hensley, Humble Oil & Refining Company, and E. H. Koepf, Atlantic Refining Company.

J. H. Dunn, Shamrock Oil and Gas Corporation and president of NGAA, will discuss the significance of the current short supply. Jake L. Hamon of Dallas, will discuss public relations.



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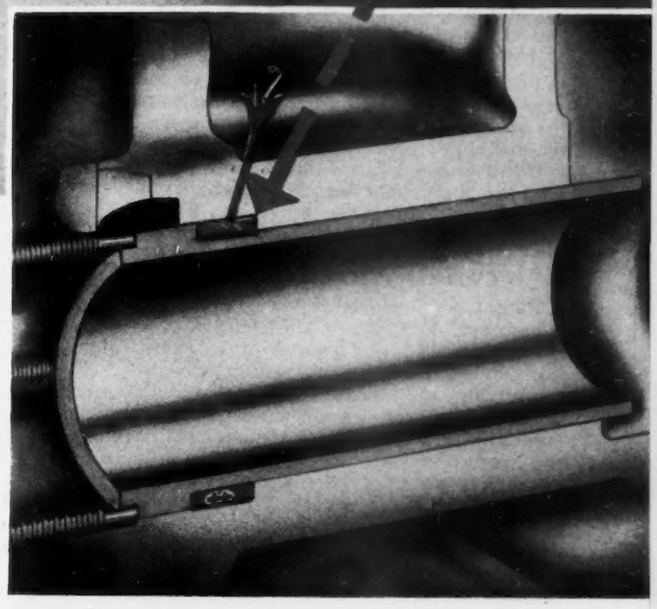

"Tattle Tale" Liner Assembly

Pump liner packings don't last forever . . . so we designed a packing that tells you when it needs replacing. No more guessing . . . no more risking cut out liner sleeves or damaged pump housings due to packing leaks.

The Sterling "Tattle Tale" Liner Assembly permits a stream of mud to squirt out of the pump when replacement is necessary. This assembly consists of two hydraulic seal rings with a grooved steel lantern ring between them. Four holes around the circumference of the lantern ring allow the mud to squirt through a small, specially drilled hole in the pump housing, warning that it is time to replace the packing.

Save your pumps . . . save your liners by installing Sterling "Tattle Tale" Liner Assemblies. Immediate deliveries on sizes for all pumps. Call your Supply Store or write for information.

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Patent Roundup

A Regular Feature of THE OIL WEEKLY

In this column are reviewed patents dealing with drilling, producing and pipe line branches of the oil industry that are issued by the United States Patent Office.

Patents issued by the United States Patent Office, Washington, D. C., include those listed below.

Printed copies of the patents listed are furnished by the Patent Office for 25 cents per copy and can be had by addressing the Commissioner of Patents, Washington 25, D. C.

Drilling Mud

The patent (No. 2,414,381) for this drilling mud and process was issued to Norman E. Martello, Turtle Creek, Pa., and assigned to Hall Laboratories, Inc., of Pittsburgh.

The process of controlling the viscosity of aqueous drilling mud comprises the addition of a mixture containing water-insoluble potassium metaphosphate and water-insoluble sodium metaphosphate in the proportions by weight from about 2:1 to 1:5 of the potassium metaphosphate to the sodium metaphosphate.

Cleaning Well Perforations

Patent No. 2,414,349, issued to Ford I. Alexander, Whittier, Calif., is a means for clearing obstructions from perforations along a length of casing. A relatively thin and uniform thread of high velocity explosive with a length substantially equal to the vertical length of the section to be cleared and having a detanative velocity of almost as much as 15,000 feet per second is suspended by a means vertically in the well, its length co-extensive with the length of the section to be cleared. There is a means for detonating the thread.

Identifying Formation Samples

This patent (No. 2,414,246) applies to the rotary method of drilling wells and was issued to Alonzo L. Smith, Houston.

The method consists of introducing into the pumped drilling fluid at the surface a fragile, breakable container having inside identifying markers. This container is pumped to the drill bit and is there broken by drilling fluid pressure. The fluctuation in pump pressure when the container is broken and the markers are released is recorded.

Locating Formations

One half of this patent (No. 2,414,194) has been assigned by George H. Ennis, Long Beach, Calif., to Robert V. Funk, also of that city.

It is an electrical process for determining the nature of geological formations crossed by a well which has casing set, and consists of transmitting an electrical current from the casing into the formations and determining the distribution of the electrical field resulting. The depth of the drill hole at points adjacent to the casing results as a measure of the varying character of the formation crossed by the well.

Well Surveying Device

This instrument, (patent No. 2,414,-702) issued to George A. Smith, Philadelphia, and assigned to Sperry-Sun Well Surveying Company, is a means for supporting a record member within a well casing, on one side of the member being located a pendulum and a magnetic compass on the opposite side of the member. A pair of electrically energized means produces simultaneously on the record member records of the positions of the compass and pendulum, respectively. Power is supplied separately to the respective means for the recording of the pendulum and compass positions located on opposite sides of the record member and to the compass so that current-carrying leads do not extend past the level of the magnetic compass.

Treating Wells

This method has been patented (No. 2,414,668) by George L. Ratcliffe, Los Angeles, and assigned to National Lead Company, Los Angeles.

Adjoining a formation containing clay an organic cationic reagent is introduced. The organic radical of the reagent is exchangeable with the cation of the clay and adapted to disintegrate the clay to its ultimate particle size so that it will be dispersable in oil.

Tube Bending Machine

Robert F. Burke, Phoenixville, Pa., has assigned this patent (No. 2,414,926) to Boiler Engineering & Supply Company of the same city.

This machine has a support member with a straight portion and one oblique end and die mechanisms slidably mounted on both the straight portion and oblique end of the support member for adjustment to and from one another so that they may be positioned at preselected locations where a pipe is to be bent. Each of the mechanisms includes a die segment and a bending lever and a grooved wheel; also a means to clamp a tube in a stationary position while being bent.

Soil Gas Prospecting

This method of prospecting for oil in which sampling holes are drilled at spaced intervals to a depth of several feet over the area to be investigated and soil gas samples are recovered from a point near the bottom of the holes and analyzed for their content of a significant constitutent (No. 2,414,913) has been patented by Philip S. Williams, Tulsa, and assigned to Standard Oil Development Company.

A fluid is passed through portions of the earth surrounding the hole, representative of the layer overlying the sampling point and the rate of travel of the fluid through the portion of the earth under a known pressure is measured. From these values the average permeability of the layer over the sampling point may be determined and variations of this permeability over the area may be applied to the determination of the significant constitutent as a correction factor.

Hammer-Lock Union

This patent (No. 2,417,025) was issued to Alexander S. Volpin, Houston, and assigned to Knud I. Braunn, Houston or, Turbolite Company.

This pipe or rod coupling includes a bushing for connection to one pipe, a head for connection to the other pipe, a clamp ring engaging the bushing, interfitting portions on the head and ring to exert a force pulling the bushing and head together upon relative rotation, and a tapered means carried by and slidable in the ring to engage the head, wedging the head and ring against relative rotation. The means can be hammered into and out of locking position.

Well Cementing Apparatus

This tool was patented (No. 2,416,842) by Charles M. O'Leary, Houston, and assigned to Herbert M. Otis, Dallas.

The apparatus consists of a member which may be positioned in the well and which has a slot closed by a back pressure valve, a packing means around the member and a cement tube communicating with the passage of the member for discharging cement into the well bore below the member, and an elastic boot around the lower portion of the member having a normally closed yieldable section through which cement may be forced below the member.

Hydrostatic Well Bailer

James J. Santiago, Los Angeles, has been granted a patent (No. 2,415,608) covering a hydrostatic well bailer, and has assigned it to Grant Oil Tool Company of Los Angeles.

Designed to bail fluid from a well bore, this device consists of a charge-receiving chamber, a dump port, tubular mandrel which moves vertically within the bailer body to open and close the dump ports, and a ball check valve which prevents any downward movement of the fluid. The mandrel keeps the slide valve closed by virtue of its weight during its travel up and down the hole. When set on bottom, the valve opens, permitting fluid to enter the receiving chamber. Immediately above this chamber is a ball check valve, which may, if need be, released by clockwise rotation of the bailer.

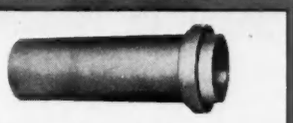
Pump Seal Assembly

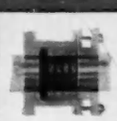
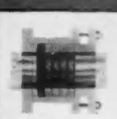
The patent (No. 2,417,349) for this assembly is owned by Samuel Gordon Colbaugh, Kilgore, Tex., and is unassigned.

The pump includes a liner, which consists of a rigid hollow metal cylinder, and internal shoulder, a sealing cylinder disposed in the liner with one end adjoining the shoulder, and a means to seat the liner in the pump. A member connected to the liner affixes the sealing cylinder in the liner. The cylinder is of resilient material and has a reinforcing sleeve imbedded therein and symmetrical rounded corrugations internally in the resilient material.

A Composite Service For Your Mud Pump

All The Wearing Parts For The Fluid End of Your Pump Can Be Replaced From This One Source



PISTONS		LINERS					RODS				VALVES AND SEATS		WATER END ROD PACKING			STEAM END PACKING			VALVE STEM PACKING			OUTSIDE LINER SLEEVES		
List Per Set (2)	Approx. Shipping Weight Per Set (2) Lbs.	Part No.	SIZE	Forged Steel with Integral Collar List	File-Hard Steel with Integral Collar List	Approx. Shipping Weight Each, Lbs.	Part No.	Regular Steel List	File-Hard List	Approx. Shipping Weight Each, Lbs.	Complete Set List	Approx. Shipping Weight Complete Set Lbs.	Part No.	Per Set (2) Price	Approx. Shipping Weight Per Set (2) Lbs.	Part No.	Per Lb. Price	Approx. Shipping Weight Per Set (2) Lbs.	Part No.	Per Lb. Price	Approx. Shipping Weight Per Set (2) Lbs.	Part No.	Per Lb. Price	Approx. Shipping Weight Per Set (2) Lbs.
ACME 12" x 6¾" x 12"																								
$30.00	60	1-A	6¾" Standard	$49.23	$55.00	65	1 A.P.I.-3	$14.20	$24.70	19	$116.60	96	600	$5.00	3	300	$1.75	3½	800	$1.75	2	300-A	$0.60	8
29.25	55	1-G	6½" Reduced	61.20	67.50	83																		
28.50	46	1-H	6¼" Reduced	65.70	70.00	95																		
27.50	42	1-V	6" Reduced	67.50	72.50	105																		
27.25	33	1-C	5¾" Reduced	69.30	75.00	117																		
27.00	30	1-E	5½" Reduced	74.40	77.50	128																		
26.75	28	1-F	5¼" Reduced	77.00	80.00	138																		
26.50	25	1-D	5" Reduced	80.40	82.50	151																		
ACME 12" x 6¾" x 14"																								
$30.00	60	2-A	6¾" Standard	$50.67	$55.00	68	2 A.P.I.-3	$14.90	$24.70	21	$116.60	96	601	$5.00	3	301	$1.75	3½	801	$1.75	2	301-A	$0.60	8
29.25	55	2-G	6½" Reduced	63.90	67.50	86																		
28.50	46	2-H	6¼" Reduced	67.05	70.00	98																		
27.50	42	2-B	6" Reduced	69.30	72.50	108																		
27.25	33	2-C	5¾" Reduced	71.10	75.00	120																		
27.00	30	2-D	5½" Reduced	80.30	77.50	131																		
26.75	28	2-E	5¼" Reduced	83.50	80.00	141																		
26.50	25	2-F	5" Reduced	85.00	82.50	154																		
ACME 14" x 7¼" x 16"																								
$35.00	70	3-A	7¼" Standard	$73.80	$82.50	83	3 A.P.I.-4	$21.20	$36.70	42	$176.00	162	602	$5.00	3½	302	$1.75	6	802	$1.75	2½	302-A	$0.60	5
34.50	65	3-B	7" Reduced	77.13	85.00	91																		
30.00	60	3-C	6¾" Reduced	80.19	87.50	107																		
29.35	55	3-D	6½" Reduced	83.16	90.00	120																		
27.50	46	3-E	6" Reduced	94.50	92.50	134																		
27.25	42	3-F	5¾" Reduced	99.80	95.00	152																		

USE THESE HANDY DATA SHEETS FROM OUR SECTION IN THE COMPOSITE CATALOG WHEN ORDERING.

●

FOR INCREASED EFFICIENCY AND LONGER LIFE USE OKEH COMPLETE REPACEMENT UNITS . . .

Your mud pump is too important and expensive a piece of equipment to abuse with "sloppy" fitting, miscellaneous or assembled replacement parts.

An OKEH Complete Rplacement Unit combines the many exclusive features of OKEH Slush Pump Pistons, OKEH File Hard Liners, OKEH File Hard Rods, OKEH Self-Sealing Lip Rod Packing, OKEH Slush Pump Valves and OKEH Outside Liner Packing.

Our modern rubber factory and machine shop permit us to manufacture, *not assemble*, these parts intended to work together, "not too loose"—"not too tight," but with sympathetic tolerances.

Why not prove this to yourself? Order a complete OKEH Replacement Unit for your pump.

●

Separate Parts Available If Desired

OKEH parts are also available separately to fit your particular pump. (See Composite Catalog pages 3697 to 3724, or write us for an individual catalog.)

Data in our COMPOSITE CATALOG section covers all sizes in these pumps:

Acme . . . Beaumont Iron . . . Dean . . . Emsco . . . Fairbanks-Morse . . . Gardner-Denver . . . Gaso . . . Gumbo Bustr . . . National Ideal . . . Oilwell . . . Wheland Wilson-Snyder . . . Worthington.

SEE PAGES 3697 TO 3724

TEXAS RUBBER & SPECIALTY CORP.

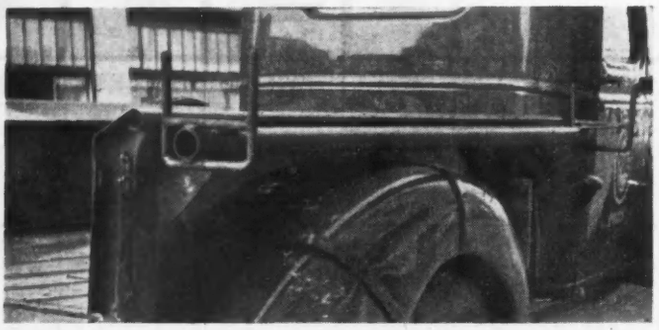
MANUFACTURERS RUBBER-STEEL PRODUCTS

HOUSTON *Export Representative:* BROWN & BECKLEY, 30 Rockefeller Plaza, New York, N. Y. TEXAS

Protect Instruments with Handy Truck Rack

EQUIPMENT CARE

When it was found that drift indicators, bottom hole pressure bombs, etc., became damaged when lying loose in the back end of a pick-up truck, one company built a rack on the side of the truck bed in which these instruments were transported safely and were readily accessible when the job was reached.



The rack was made by welding three-eighths inch plates to the sides of the stake wells and U-shaped rods welded at the top much the same as in making a rack to haul short pieces of pipe. However, a second piece of bar was welded across the U just high enough to permit a two-inch pipe nipple to lie on the bottom of the U. The pipe nipple and U were all welded securely into one unit, making an open-ended barrel to receive the instrument which has been wrapped in cloth for further protection.

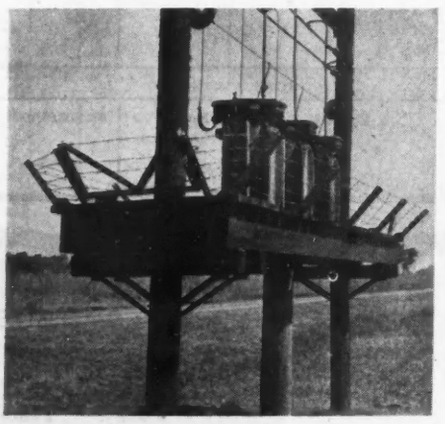
PENBERTHY
"REFLEX"
WATER GAGE SET

For oil field, locomotive type and marine boilers. Water shows black — steam shows white; the water level is unmistakable. U-Bolt construction is strongest and simplest to service. Glass replaced by simply removing nuts on face of gage . . . unnecessary to work between gage and boiler. Conforms with A.S.M.E., Federal and State requirements when used for pressures specified by their respective codes.

This is one of the complete line of Penberthy gages that meet every liquid level gage requirement.

PENBERTHY INJECTOR CO.
DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

Guard Transformer Bank



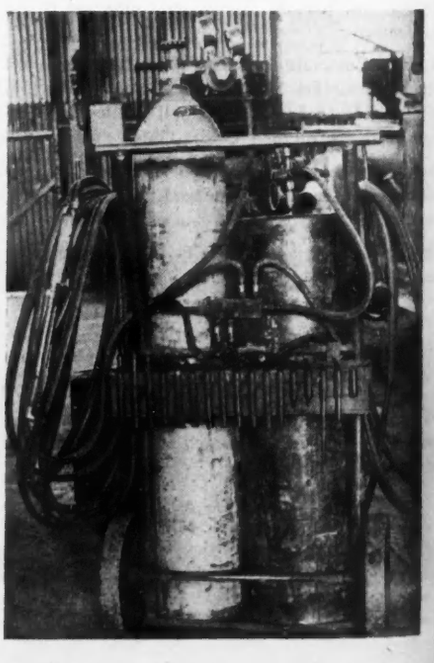
SAFETY PRACTICES

To prevent accidental injury or possible damage to the transformer bank used to furnish current to a motor-driven station, one pipe line company encloses the low platform supporting the transformers with a flaring fence of barbed wire, carried all around the platform at an angle of 45 degrees from the floor.

Angle iron brackets, formed from 2 x 2 x ¼-inch angles, are bent to the desired angle, with bolt holes in the section to fit on the floor, and with five slots burned into the upstanding flange of the angled portion of the support. The barbed wire is strung around the supports, and the thin tongue of metal on the outer side of the slot peened down to retain the wire firmly.

Access to the transformer platform is through a gate at one end of the unit. The gate is hinged to the platform so that, when released, it will swing back flat against the end joist, clearing the support so a short ladder may be placed in the opening thus made. When aligned with the remainder of the barricade, a padlock through holes in adjacent angle iron supports retains the gate in the closed position.

The fence effectively bars trespassers, but does not interfere with exchange of one or more transformers by the electric company's service truck, which swings the units over the barrier with the shear legs and truck winch without the necessity of removing any portion of the wire fence.



Speed Up Welding

WELDING AIDS

Doubling up on the usefulness of present welding equipment was obtained by the welding shop of one production department by a simple cross head connection as shown. Both the acetylene and oxygen bottles are mounted on the popular type push cart, with the addition of a special fitting located on a bracket near the center of the cart. This special fitting was made from block steel with holes drilled into the block to accept the oxygen and acetylene fittings. Into these holes were drilled two openings leading into the oxygen line and two openings leading into the acetylene line. Each of these outlets were threaded and equipped with standard hose connections.

When in operation, this arrangement makes it possible for two welders to work at the same time, using the same oxygen and acetylene supply and the same pressure controls. Where more than one machinist works in the repair shops, it is usually the case that two of the repairmen desire to use the welding equipment at the same time.

In addition to this convenient arrangement, a simple rack was made to store all the cutting and welding tips in an orderly manner, as well as provide a handy box into which the extra torches may be stored when not in use. The small box is made from heavy gauge tin and hung from the middle cross brace on the push cart. The welding and cutting tips are stored in short section of pipe welded to the metal box. This arrangement eliminates the loss of time when the welder has to change tips and must hunt through a full tool chest.

Fine Individual Parts Developed Through Direct Contact with Well Control Problems

Gray Systems of Well Control have been developed as the result of direct contact with the problems of well control, exhaustive study of the subject, and the valuable cooperation and assistance of men actually engaged in drilling and producing. They are based on a planned procedure which considers each operation as it is to be performed, the equipment required to perform it, and the coordination and concentration of this equipment into a smooth sequence of operations.

Gray Systems of Well Control are on the job around the world, shouldering the problems of men who have to work in well control. Our library of knowledge gained from the experience of 25 years, from problems solved with men who actually drill oil wells, is available to you when you use Gray Systems of Well Control.

Complete Well Head Assembly equipped with Composite Manifold, Valve Removal, Installation and Renewal.

GRAY TOOL COMPANY
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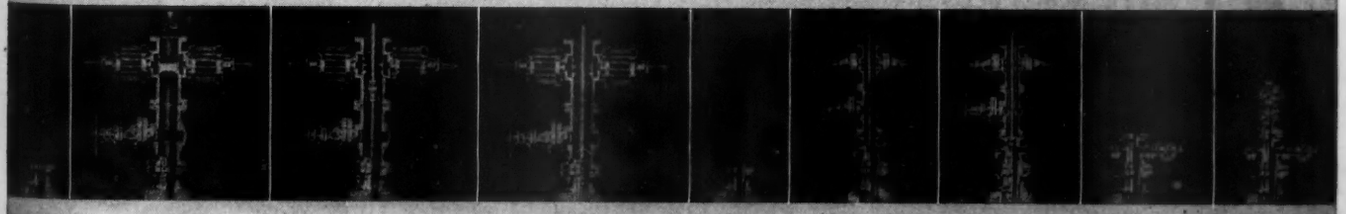


Casing Head Attached | Drilling | Running Casing | Casing Landed | Drilling Control Equipment Removed | Drilling-in and Running Tubing | Tubing Landed | Control Equipment Removed | Manifold Attached

INCREASE PRODUCTION
Clean Out with
MILLER

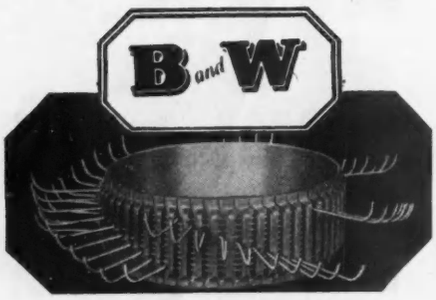
SAND PUMPS

O.D. SIZES
2½"
3 "
3½"
4¼"
5 "
5½"
7 "

LENGTHS
20'
25'
30'

REGULAR BAILERS

Miller Sand Pump Co.
General Office Box 4516
OKLAHOMA CITY 9, OKLA.
EXPORT OFFICE
30 Rockefeller Plaza
NEW YORK CITY 20, N. Y.
See Composite Catalog Page 2426



(Patented and Patents Pending)

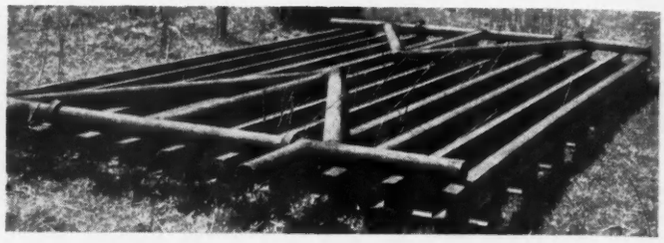
B & W Wall Cleaning Guides are your best insurance for a good cement job the first time

DON'T SQUEEZE!

It Can Be Avoided

BRUCE BARKIS — B and W INCORPORATED — KENNETH WRIGHT
Well Completion Specialists
HOUSTON, TEXAS • LONG BEACH, CALIF.

Build Cattleguards at Central Welding Shed



SHOP OPERATION

Instead of building cattleguards on the spot where they are to be used, one company utilizes bad weather periods for fabricating them at the welding shed adjoining the main line station.

The guards are built from scrap railroad rails, using either 60- or 80-pound rails, depending on the traffic which the guard is to carry. Twelve rails, spaced on six-inch centers, are welded to eight cross members of the same weight steel, the end cross-members being set back a foot from the ends of the rails.

The end sections are formed from 2½-inch pipe welded together to form a triangle set on an extended base piece which is made long enough to span the entire guard. Two saddles or heavy strap steel are welded to two of the rails to hold this base pipe, but to allow it to turn freely within them. Stops, consisting of two 12-inch long nipples, are welded to this base pipe, on the side opposite from the triangular section. The stops, swinging between adjacent rail ends, come to rest against the outer cross-member when the triangle has swung outwardly to an angle of about 60 degrees with the horizontal.

A vertical section of pipe, extending from the vertex of the triangle to the base member, is provided with holes through which the wires of the fence may be strung and crimped, completing the enclosure with a gap which is cattle-tight but which affords unrestricted entry to the widest truck or trailer and which, when set on concrete or timber foundations, will withstand the heaviest loads without fracturing welds or sagging.

The end sections are wired to the rails for ease in handling, and the entire unit is easily trucked to the required site, and there unloaded with the truck winch—ready for skidding onto the foundations and immediate use.

Use Hard-to-Lose Flow-Line Valve Wrench

HAND TOOLS

Use of a plug-type valve for controlling flow from tanks to pumping units necessitates one wrench for the valve plug and another for tightening the nut which applies pressure between the conical faces of plug and valve body.

The double-ended open or "S" wrench sometimes provided also fits other equipment, and thus may be "borrowed" when a tank change is to be made. It also sometimes tends to slide off the square or tip sideways if the valve is hard to turn.

One producer provides a specially fabricated wrench for the plug valves, forming from heavy pipe nipples box wrenches or sockets which fit the plug end and adjusting nut. The two boxes are then welded to a short handle of one-inch pipe, with the boxes facing in opposite directions to afford clearance. The handle is also offset slightly to afford better knuckle clearance when swinging close to the flow line.

The sockets contact the valve part all around, and thus insure a firm hold, eliminating accidents caused by the wrench slipping. They also distribute wear over the entire valve part and distribute torque evenly, making for easier rotation of the plug.

$5.00 is paid for each illustrated acceptable contribution. Mail to The Editor, THE OIL WEEKLY, P. O. Box 2608, Houston 1, Texas

The "DEVIL-DOG" IS BUILT TO TAKE IT!

Careful boxing assures clean chain. Easy-to-read labels facilitate handling and storage.

Jeffrey OIL WELL CHAINS

There are sound reasons for the toughness and long wear of Jeffrey Chains. All manufacturing steps are controlled in our own plant. These include the selection of special alloy steels, individual treatment of various parts, precision machining and balanced construction.

Because it is free from "initial stretch," a Jeffrey Devil-Dog requires no "breaking-in." It performs like a veteran the first day and every day.

JEFFREY

ESTABLISHED 1877

THE JEFFREY MANUFACTURING COMPANY, 985-99 North Fourth Street, Columbus 16, Ohio

Cutback in Crude Runs to Stills Brings Decreased Output of Refined Products

A moderate cutback in the amount of crude run to refinery stills resulted in decreased output of all principal refined products during the week ended April 5, according to The API. Production of crude and stocks of refinable crude were increased to new high marks for the year.

The week's daily crude production increased 27,000 barrels from the previous week's to average 4,892,000 barrels, the highest level for this year. The daily output topped that of last year's comparable week by 446,000 barrels or 10 percent. Stocks of refinable crude totaled 227,529,000 barrels on March 29, according to the Bureau of Mines, after an increase of 1,809,000 barrels during the preceding seven days. Those stocks exceeded those on hand a year before by 2,535,000 barrels or 1.1 percent.

Crude runs to stills were decreased 71,000 barrels a day during the week to average 4,772,000 barrels daily, which was an increase of 239,000 barrels or 5.3 percent over runs of the like period a year ago.

Gasoline production, including natural blended at the refinery, amounted to 14,374,000 barrels in the week. That was a decline of 22,000 barrels from the week before, but was 1,042,000 barrels of 7.8 percent more than was produced in last year's corresponding week. Stocks of finished and unfinished gasoline continued the seasonal downward swing started in the previous week. They were reduced 610,000 barrels to 106,966,000 barrels at the week's end, which were still 3,279,000 barrels or 3.2 percent more than were in storage a year previously.

Distillate fuel production was off 316,000 barrels from the previous week to 5,653,000 barrels. That was 467,000 barrels or 9 percent over production of last year's like period. Stocks of distillate had not yet reached their turning point as 379,000 barrels were withdrawn from storage leaving them at 32,358,000 barrels. That amount was 1,891,000 barrels or 6.2 percent greater than stocks of a year ago.

The week's output of residual fuel oil totaled 8,206,000 barrels, a decrease of 462,000 barrels from the previous week's and only 9000 barrels over production a year ago. A net gain of 177,000 barrels in stocks of residual brought them up to 43,541,000 barrels at the end of the week, which were 6,335,000 barrels or 17 percent over stocks a year ago.

Trends of Operations and Changes in Stocks

Figures on crude stocks are from Bureau of Mines weekly reports; all others from American Petroleum Institute weekly reports, which are estimates on Bureau of Mines basis.

(All Figures in Thousands of Barrels—Add 000)

HIGHS AND LOWS OF RECENT YEARS

ITEM	Crude Oil Prod. Barrels Daily	Crude Oil Prod. Week Ended	Runs to Stills Barrels Daily	Runs to Stills Week Ended	Crude Stocks Barrels	Crude Stocks Week Ended	Gasoline Stocks Barrels	Gasoline Stocks Week Ended	Gasoil and Distillate Stocks Barrels	Gasoil and Distillate Stocks Week Ended	Residual Fuel Oil Stocks Barrels	Residual Fuel Oil Stocks Week Ended
Highs:												
1942	4,337	2- 7	3,961	1- 3	263,208	3-28	[1]109,281	3-14	47,861	11-14	95,857	1- 8
1945	4,944	7-21	[1]5,140	8-18	227,554	10-13	99,012	3-24	45,341	11-17	56,074	1- 6
1946	[1]4,961	6-15	4,968	[1]2-28	229,430	3- 2	105,233	2-16	[1]67,286	11- 9	61,636	11- 2
1947	4,892	4- 5	4,986	3-15	227,529	3-29	107,576	3-29	58,034	1- 4	53,285	1- 4
Lows:												
1945	3,621	[1]0- 6	3,409	10- 6	[2]211,813	8-25	70,791	10-13	26,483	3-17	38,548	5-26
1946	4,403	3- 9	4,498	1-12	218,193	1- 5	85,324	9-28	25,131	3- 9	37,289	4- 6
1947	4,531	1-11	4,737	2-15	220,313	2- 8	94,882	1- 4	32,358	4- 5	42,703	3-22

TRENDS OF 1946 AND 1947

Trends in Week Ended	Crude Oil Production Daily	Crude Oil Runs to Stills Daily	Crude Oil Stocks Week End	Gasoline Production Weekly	Gasoline Stocks Week End	Gasoil and Distillate Production Weekly	Gasoil and Distillate Stocks Week End	Residual Fuel Production Weekly	Residual Fuel Stocks Week End
1946:									
January 5	4,548	4,651	218,193	14,488	98,494	5,923	35,199	8,867	42,371
January 26	4,626	4,553	220,544	13,622	101,737	5,720	29,498	8,411	39,722
February 23	4,714	4,595	226,699	13,175	104,709	5,728	25,398	7,913	39,290
March 30	4,425	4,684	224,994	13,896	104,715	5,337	28,240	8,738	37,746
April 27	4,672	4,685	224,443	14,228	99,631	5,568	30,466	9,204	39,404
May 25	4,759	4,857	222,214	14,312	95,769	5,463	32,973	8,908	43,368
June 29	4,957	4,854	223,883	14,500	92,333	5,325	37,762	8,828	46,477
July 27	4,926	4,896	223,756	14,535	88,626	5,817	44,316	8,217	49,517
August 31	4,833	4,911	227,132	15,014	87,217	5,630	53,134	8,539	53,173
September 28	4,778	4,829	223,043	14,675	85,324	5,632	59,827	8,172	57,657
October 26	4,730	4,758	221,184	14,863	86,423	5,710	65,499	7,728	60,872
November 30	4,795	4,707	227,693	15,145	88,371	5,258	66,062	7,672	58,647
December 28	4,713	4,968	225,995	15,604	93,126	5,931	58,941	8,181	53,427
1947:									
January 4	4,649	4,917	223,291	15,281	94,882	5,857	58,034	8,375	53,285
January 25	4,672	4,820	221,655	14,624	99,801	5,630	50,357	8,224	48,558
February 22	4,786	4,860	224,580	14,668	103,904	5,929	40,739	8,542	44,919
March 1	4,771	4,896	225,131	15,191	105,803	5,488	38,004	8,824	45,175
March 8	4,824	4,925	223,679	14,782	106,418	5,572	36,601	8,496	44,202
March 15	4,845	4,986	222,341	15,125	106,813	5,025	34,384	8,916	43,734
March 22	4,862	4,885	225,720	14,440	106,526	5,968	32,993	8,621	42,703
March 29	4,865	4,843	227,529	14,396	107,576	5,969	32,737	8,668	43,364
April 5, 1947	4,892	4,772	.....	14,374	106,966	5,653	32,358	8,206	43,541
April 6, 1946	4,446	4,533	[3]224,994	13,332	103,687	5,186	30,467	8,197	37,206
Change:									
In Week	+27	−71	+1,809	−22	−610	−316	−379	−462	+177
In Year	+446	+239	+2,535	+1,042	+3,279	+467	+1,891	+9	+6,335
In Year	+10.0%	+5.3%	+1.1%	+7.8%	+3.2%	+9.0%	+6.2%	+0.1%	+17.0%

[1] All time peak. [2] Lowest since December, 1921. [3] Stocks, March 30, 1946.

Products Prices Are Generally Unchanged; Demand Still Firm

Prices for petroleum products remained generally unchanged during the week, as demand for all products continued firm and supplies bordered on the scarce side in some areas. While light fuel oil showed slight signs of easing, demand for gasoline and heavy fuels was increased, the latter being caused partly by the stoppage of coal mining.

No. 2 fuel oil was reported by New York harbor suppliers to be tight in that area, but unconfirmed reports were current in the early part of the week that barge lot sales had been made to suppliers for 6.55 cents. However, most suppliers reported they were unable to find any material at that price. One supplier said he had received an offer to purchase No. 2 fuel in cargo lots at 6.7 cents delivered at the harbor or 5.75 cents FOB at the Gulf Coast.

Several Gulf Coast suppliers quoted 6.5 cents for kerosine and 5.5 cents for No. 2 fuel oil, but indicated they were considering revising their prices in view of active demand for these products. Others asked 6.75 and 5.75 cents for kerosine and No. 2 fuel, and some of these indicated they might ask even higher prices; but regardless of price, most suppliers appeared to be holding all products closely and not extremely anxious to sell.

The week saw demand for all grades of lubes remain extremely heavy in Pennsylvania, with no appreciable increase in stocks. Foreign and domestic inquiry for bright stock remained comparatively heavier than for neutrals. Several refiners in that area who had previously reported some improvement in the supply of lube oil containers, expressed concern over the effects that the coal stoppage would have on steel and container manufacturers.

Tax Bill Fails

A proposed severance tax on oil, natural gas and natural gasoline produced in California was voted down, ten to four, by the State Assembly Committee on Revenue and Taxation. The measure, sponsored by Assemblyman George L. Collins of San Francisco, would have brought in $90 million a year, according to Collins, all of which was earmarked for highway construction. The bill called for a tax ranging from 14 cents per barrel on oil of less than 15 gravity to 27 cents per barrel on 34 gravity and above, plus 1.2 cents per thousand cubic feet of natural gas and 1.2 cents per gallon on natural gasoline.

• Oklahoma

All But 1500 Feet of Pipe Recovered at Record Test

All but 1500 feet of drill pipe recovered at world's deepest test; Grant County wildcat may be oil pool opener; Calvin sand pay proved in Dora pool; prospective pool opener in Noble County gets free oil on test; shallow oil pool opened in Rogers County; Ohio to try deep test on northwest end of Knox pool.

Caddo County: The world's deepest fishing job has proven partially successful, as crews of The Superior Oil Company of California's Weller 51-11, NW NW NE 11-8n-12w, near Fort Cobb, severed stuck drill pipe at 15,736 feet. After three weeks of attempts to cut the pipe, which became stuck March 15 about 25 feet off bottom, a cut was finally made, and all but 1500 feet of drill pipe recovered. Crews are now washing over the remaining pipe and hope to free it from shale cavings. If the drill pipe left in the hole cannot be recovered, operators probably will set whipstock and bypass. The current fishing job it the most serious yet encountered at the well. The cavein occurred when crew was coming out of the hole to change rock bits. Total depth is 17,236 feet. J. C. Corley, drilling superintendent, and John Cody, general superintendent, have been supervising the fishing job.

Grant County: An oil pool apparently is being opened east of the town of Nash by Stauffer Petroleum Company. Hall 1, NE NE SE 9-25n-7w, recovered free oil and a show of gas on drill-stem test in the Mississippi lime at 5480-525 feet, total depth. The formation was topped at 5440 feet. A show of gas and 375 feet of fluid, of which some was free oil, were recovered on a drill-stem test at 2500-25 feet. After tester was pulled gas increased and was cutting the mud. Some saturation was reported in the Layton sand but the zone was not tested. Contract is for the Wilcox sand.

Seminole County: The Caronado Oil Company has proved Calvin sand production on the north side of the Dora pool with Huddleston 1, NW SW NE 29-7n-6e. The formation was topped below 2400 feet, and with 7-inch pipe set at 2405 feet, plug was drilled to 2410 feet, and crew swabbed and flowed 225 barrels of oil in 24 hours. The company is rigging up rotary for Billington 1, SW NW NE Sect. 29, offset to the new oiler. The Earlsboro sand, a deeper formation, is the main pay in the field.

Noble County: Kingwood Oil Company apparently has opened an oil pool nearly 2 miles southwest of the new Southeast Ceres discovery. Boley 1, SW SW NW 35-23n-1w, recovered 800 feet of 41-gravity oil and 120 feet of oil-cut mud with no water on a drill-stem test taken in a saturated sand at 4471-83 feet. Tool was open 12 minutes and gas showed in 3 minutes and oil in 7 minutes. Bottom hole pressure was 2100 pounds after 10 minutes, and flow pressure 600 pounds. The sand is in the Cherokee sector but it has not been determined whether it is the Bartlesville or Skinner sand.

Rogers County: A shallow oil pool has been opened by Homer Wharton and associates. Holland 1, SW SE NW 28-23n-15e, near Oolagah townsite, was pumping about 25 barrels of oil per day from the Mississippi lime, topped at 1115 feet. Total depth is 1250 feet. Operators are drilling 2 more wells in the vicinity. Practically all production in the county is from shallow Pennsylvanian formations.

Grady County: The Ohio Oil Company, which proved production in the Dornick Hills sections of the Knox pool, will try a deep test on the northwest end of the field. Mecklenburg 1, SE NW SE 6-3n-5w, will be taken to 6000 feet. The company recently proved a new zone for the field on its west flank. The well, Woods 1, NE SW NE 17-3n-5w, is making more than 30 barrels of oil per hour at 3564-92 feet, and at 3492-3512 feet.

Kansas Office Opened

Operating department offices have been opened in Wichita, Kansas, by Cities Service Gas Company, at 212 N. Market Street. Forty-seven employes are now working at the offices, according to S. B. Irelan, company president.

• Kansas

Pool Opened Near Abandoned Producer in Stafford County

Well near abandoned producer opens oil pool in Stafford County; Ash Creek pool extended into Pawnee County; Boggs South pool gets good oiler; gasser makes 3½ million cubic feet in Whelan pool.

Stafford County: Plains Exploration Company apparently has opened an oil pool a mile south of the Gates pool, on a site near an abandoned producer. Batman 1, NW NW SW 2-22s-13w, 2 miles west of the Drach pool, swabbed at the rate of 16 barrels of oil an hour for 4 hours 1500 feet off bottom, in Arbuckle lime, topped at 3685 feet. Total depth is 3692 feet. The well is ¼ mile southeast of W. N. Bartlett's Kisner 1, completed for 148 barrels of oil per hour in October, 1943, and abandoned 13 months later. Arbuckle in this test was topped at 3696 feet.

Pawnee County: Oil production in the Ash Creek pool of Barton County has been extended ½ mile south into Pawnee County by Bay Petroleum Corporation. Wise 1, NE NE NE 1-21s-16w, flowed 25 barrels of oil per day following light acid treatment, from Arbuckle lime at 3751-816 feet. The well is making an esti-

Wells Completed in the United States in Week Ended April 5, 1947

Data preliminary and subject to revision. Revised and more complete data on all completions and exploration shown in monthly summaries published in last issue of each month.

State or District	FIELD COMPLETIONS: New Wells: Oil	Dist.	Gas	*Input	Dry	Total	Old Wells Deepened	EXPLORATORY COMPLETIONS: Oil	Dist.	Gas	Dry	Total	ALL COMPLETIONS: This Week	Last Week	This Week 1946
Alabama	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....
Arkansas	3	....	....	....	1	4	....	....	....	....	2	2	6	4	3
California	41	....	1	....	....	42	....	....	....	....	11	11	53	31	37
Colorado	1	....	....	....	....	1	....	....	....	....	2	2	3	4	4
Florida	....	....	....	....	....	....	....	....	....	....	1	1	1	....	1
Illinois	17	....	....	1	9	27	....	....	....	....	5	5	32	39	52
Indiana	12	....	....	1	7	20	....	....	....	....	2	2	22	9	9
Kansas	27	....	7	....	8	42	3	....	....	....	5	5	50	45	39
Kentucky	8	....	....	....	5	13	....	2	....	....	2	4	17	6	12
Louisiana	15	1	3	....	7	26	1	1	....	....	2	3	30	23	25
N. Louisiana	5	....	1	....	4	10	1	....	....	....	2	2	13	12	11
S. Louisiana	10	1	2	....	3	16	....	1	....	....	....	1	17	11	14
Michigan	4	....	....	....	4	8	....	....	....	....	1	1	9	14	13
Mississippi	4	....	....	....	....	4	....	....	....	....	1	1	5	6	5
Montana	1	....	....	....	1	2	....	....	....	....	....	....	2	....	7
New Mexico	7	....	....	....	1	8	2	1	....	....	....	1	11	12	11
New York	15	....	....	10	....	25	....	....	....	....	....	....	25	21	26
Ohio	5	....	11	....	8	24	....	....	1	....	1	2	26	28	12
Oklahoma	45	....	2	....	19	66	3	....	....	....	14	14	83	93	46
Pennsylvania	27	....	5	15	....	47	....	....	....	....	....	....	47	45	49
Texas	92	4	8	6	29	139	2	8	....	....	30	38	179	169	157
Districts:															
1.—S. Central	4	....	....	....	....	4	....	....	....	....	1	1	5	5	3
2.—Middle Gulf	8	1	....	....	1	10	....	....	....	....	1	1	11	18	[1]
3.—Upper Gulf	10	1	....	....	2	13	....	1	....	....	2	3	16	20	17
4.—L. Gulf-S.W.	5	2	1	....	4	12	....	1	....	....	6	7	19	25	32
5.—E. Central	1	....	1	....	1	3	....	....	....	....	1	1	4	4	[2]
6.—Northeast	8	....	1	1	1	11	....	....	....	....	3	3	14	7	10
7-B.—N. Central	5	....	2	....	5	12	....	5	....	....	7	12	24	6	[3]
7-C—W. Central	1	....	....	....	....	1	....	....	....	....	1	1	2	2	4
8.—West	28	....	....	....	1	29	2	....	....	....	1	1	32	27	45
9.—North	17	....	....	5	12	34	....	1	....	....	7	8	42	44	40
10.—Panhandle	5	....	3	....	2	10	....	....	....	....	....	....	10	11	10
West Virginia	....	....	10	1	2	13	1	....	....	....	....	....	14	16	18
Wyoming	1	....	....	....	....	1	....	....	....	....	....	....	1	3	1
Total U.S.	325	5	47	34	101	512	12	12	1	...	79	92	616	569	527

* Includes salt water diposal wells. [1] Middle Gulf included with Lower Gulf-S.W. [2] East Central included with Northeast. [3] N. Central included with North. [4] West Central included with West.

mated 2 million cubic feet of gas daily. Flow of oil was estimated after crews took a 4-hour test.

Barber County: The Boggs South pool, discovered by Skelly Oil Company, has another good producer. Skelly's Boggs 2-C, SE SE SE 17-33s-12w, flowed an estimated 600 barrels of oil in 11 hours and made 400,000 cubic feet of gas from the Simpson sand at 4841-88 feet. The well made 414 barrels of oil through 5/16-inch choke on 18-hour flow test. Tools are below 4600 feet at the company's Boggs 3-C, SE SW SE 17-33s-12w.

The Whelan pool received a 3½ million-foot gasser when Olson Drilling Company found pay in the Mississippi lime. Schwartz 2-D, CSE NE 31-31s-11w, made the flow through perforations in the Mississippi at 3347-60 feet.

Veterans Rejoin Socony

Of 4800 employes released from the armed forces, more than 90 percent have returned to positions with Socony-Vacuum Oil Company, Inc., officials of the company said in the annual report. The 5300 Socony-Vacuum employes who entered military service during World War II, according to the report, received $5 million in benefits under the company's military plan.

Bartlesville Celebrates

Bartlesville, Okla., one of the state's most active oil centers and site of Oklahoma's first flowing well, celebrated its 50th anniversary April 1 with parades, community meetings and entertainment. The first flowing well in the state was drilled at Bartlesville in 1897 and is still flowing ½ barrel per day.

• New Mexico

Hobbs Shallow Zone Is Source Of High-Gravity Production

Shallow oil zone passed up in developing Hobbs field attaining importance as source of high-gravity oil production; outpost for Lea County's latest discovery nearing oil zone; San Juan County deep test in process of completion from Basal Dakota.

Lea County: The development of the 3200-foot Bowers sand zone in the Hobbs field has reached a competitive basis, and progressive offsets will require considerable drilling or the plugging back of old wells for re-completion through perforations. This zone has accounted for 12 oil wells and a gasser within the last six months. Tide Water Associated Oil Company's State 1-B, northwest edge of the field, has been producing from this zone since 1935 due to missing the regular pay. Amerada Petroleum Corporation's Hardin 4, C SE SW 18-18s-38e, north edge of the field, will attempt to complete from the Bowers, having cemented pipe at 3180 feet and above the pay.

The Texas Company's Garrett 1, discovery 9 miles east by north of the Lovington field, was pumping 38 barrels of oil and 33 barrels of water on latest gauge from 2 zones of perforations and open hole in the San Andres, which was drilled to 5760 feet. The company's State 1-AK, 1¼ miles northwest, recovered junk and was drilling at 5160 feet. The outcome of these wells will determine if owners of short-term leases will start development promptly.

San Juan County: Byrd & Frost, Inc., et al's Hargrave-Federal 1, Kutz Canyon shallow gas field initial deep test, continued to improve in outlook for a commercial gasser and high gravity discovery as cleanout work progressed with cable tools. The volume of gas is increasing and the well makes occasional heads of 57-gravity oil, or distillate. The well is bottomed at 6721 feet in Basal Dakota, and the last 25 feet of white sand, which was erroneously reported to be water sand, proved to be the most effective pay encountered since entering the Dakota near the 6485-foot level. The formation has absorbed considerable rotary fluid, which involved mud weight and pressure of 4000 to 5000 pounds against bottom-hole pressure of 2100 pounds, and owners expect the well will be slow in attaining its maximum production.

Penn Grade Assignments

G. W. Holbrook, Bradley Producing Corporation, Wellsville, N. Y., has been named chairman of the production research advisory committee of the Pennsylvania Grade Crude Oil Association.

A committee, named by D. T. Ring, president, will survey the association's patent holdings, the group including E. E. Ebner, Quaker State Oil Refining Corporation, Emlenton, Pa.; Joseph Hinman, Pennzoil Company, Oil City, Pa.; MacLean Houston, United Refining Company, Warren, Pa.; B. L. Heath, Freedom-Valvoline Oil Company, Freedom, Pa.; Dr. Merrell Fenske, Pennsylvania State College, State College, Pa., and Fayette B. Dow, Washington, association vice president and general counsel.

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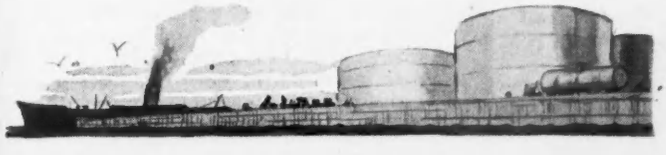

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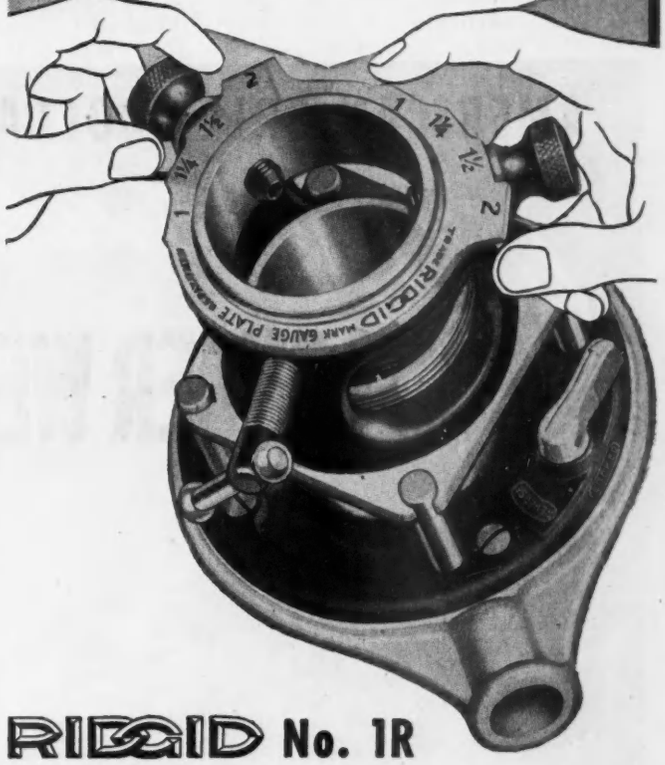

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• West Texas

Petersburg Field Confirmation Has Water in Pennsylvanian

Confirmation test for Petersburg field reaches water in Pennsylvanian without show of oil or gas; multi-pay wildcat in Crane County adds Ellenburger to its oil-pay zones; Devonian oil flow in store for the Midland field.

Hale County: Stanolind Oil & Gas Company's LaFont 1, southeast offset to the Petersburg field sweet oil discovery from Upper Cisco (Pennsylvanian) at 6890-992 feet, was drilling lime at 7185 feet after testing water at 7126-75 feet. This structurally-low failure eliminated what was rated as prospective producing acreage.

Crane County: Gulf Oil Corporation's University 1-HH, SW NE Sect. 3, Block 31, 3¾ miles north by east of the Block 31 2-pay field, was assured of about 100 feet of Ellenburger section without water, and showed for commercial production from this zone. The Ellenburger was entered at 10,596 feet, with elevation 2659 feet, and a drill-stem test at 10,623-49 feet yielded 7109 feet of 45.8-gravity oil, while the next 25-foot zone yielded 6700 feet of oil. A third drill-stem test at 10,700 feet failed due to packer slipping, but no water was indicated in cores. A syncline, confirmed by geophysics and an intermediate failure, separates this producing area from the Block 31 field, which has 10 Ellenburger wells that entered this zone at depths ranging from 10,250 to 10,390 feet. Gulf's discovery also indicated possible production in the Waddell, McKee, Silurian and Devonian, but the Ellenburger was the prime objective.

Concho County: B. A. Duffy et al's Wilson 1, C NW NW H&TC 76, Block 8, abandoned in 1943 at 3897 feet, was showing for a Pennsylvanian discovery after plugging back to 3875 feet and acidizing open hole at 3682-875 feet. The well was swabbing 3 to 4 barrels of 45-gravity oil hourly, with some basic sediment and water showing, and will be reacidized. Floyd C. Dodson et al's Wilson 1, 1¼ miles south by east, was completed in 1941 as a marginal pumper from Pennsylvanian pay at 3754-65 feet after plugging back from Cambrian at 4102 feet.

Kent County: Humble Oil & Refining Company's Boren 1, north offset to its Ellenburger discovery for the Polar 2-well pool, cemented 5½-inch casing on bottom at 7795 feet after recovering oil- and gas-cut mud when tester was used in Ellenburger section, topped at 7763 feet, or 7 feet low. Development has been on a cautious basis due to 3 outlying failures.

Midland County: Humble's Floyd 1, C NW NE T&P 16, Block 37, T-3-S, 3¾ miles southeast of its small pumping discovery from the Wolfcamp at 8500-65 feet and 5¼ miles southeast of its Midland field Pennsylvanian discovery at 10,370-90 feet, was setting liner to complete after developing a small flow of 46.7-gravity oil on extended drill-stem test of the Devonian section at 11,185-301 feet. Seven-inch casing had been cemented at 10,215 feet to protect possible production in Basal Wolfcamp and in the Strawn section of the Pennsylvanian. Floyd 1 is on a 6381-acre checkerboard lease that was due to expire in April. The 2 completed wells tested nominal shows in the Devonian before plugging back, while a 11,620-foot failure northwest of the discovery also made an unsuccessful test of the zone. Floyd 1 correlates 138 feet high on the Devonian with the discovery; 135 feet high to the failure, and 84 feet high to the nearest, or Wolfcamp producer. Considering the distance between wells, this area registers unusual flatness of the Devonian beds, which ordinarily are subject to erosion, or tilted. Humble's Dixon 1, north offset to Floyd 1, was started in February to forestall lease expiration, and was drilling at 4830 feet. Magnolia Petroleum Company and Skelly Oil Company have acreage within the discovery block.

Crockett County: Gulf's University 1-R, recent Grayburg lime discovery resulting from core drilling of the 4160-acre lease to select site for a second Ellenburger test, pumped 76 barrels of oil on 22-hour test at 1685 feet. Spudder has been moved in to drill a second shallow test.

Cities Service Oil Company-Plymouth Oil Company and Humble's Owens 1-B, Ellenburger prospect and 1¼ miles northwest of the Clara Couch shallow field, was making progress in recovering lower section of drillpipe lost after the well blew out at 5806 feet and flowed a large volume of oil, gas and water for 3 days before being killed. Opinion differs as to whether this flow was from the Crinoidal (Pennsylvanian), or Wolfcamp. The latter does not have a good production performance in the district.

Ector County: The Texas Company's

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TXL 2-D, C NW SW T&P 27, Block 45, south offset to its Southeast TXL-Ellenburger pool discovery at 10,790-890 feet, cemented pipe at 10,744 feet, or 6 feet off bottom. It is situated favorably for production. This area involves Ellenburger production down-dip and on the east side of the fault that severs the TXL field, and failures were drilled north and northwest of the discovery.

Directory Issued

Gulf Coast Oil Directory, Scanlan building, Houston, has issued its 1947 edition that lists the producers, drilling contractors, engineers, geologists and equipment concerns in each of the important oil centers along the Texas-Louisiana Gulf Coast, according to G. E. Wimberly, publisher.

• North Texas

Archer Deep Lime Area Leads In Proved Undrilled Locations

Southern Archer County deep lime area leads in volume of proved undrilled locations; Strawn field in Haskell County assured of 4 producers from 2 zones; oil zone opened in Northwest Walnut Bend field.

Archer County: Development of the Burns-Benson deep area, which was opened in May, 1945, is gaining momentum as the result of recent extensions north, northeast and east. This field gives promise of expanding to more than 3000 productive acres from the 4400-600-foot Bend lime, while it also yielded a few Strawn and Mississippi wells. Homer W. Snowden Oil & Gas Company's Dot Andrews 1, 990 feet out of the southwest corner of the J. B. Hinds Survey A-184, linked the original Bend area with the northeast extension sector in showing for a 60 to 70-barrel pumper after acidizing perforations at 4528-60 feet and 4592-602 feet in Bend, topped at 4570 feet. The area leads the district in volume of proved undrilled locations.

Haskell County: Tom Humphrey et al's Chapman 3, south offset to the Upper Strawn lime discovery for the Humphrey-Chapman field, pumped and flowed 149 barrels of oil initial from Lower Strawn sand at 4228-68 feet, establishing a new pay for the area. Amerada Petroleum Corporation's Holt 1, north outpost, swabbed water with trace of oil from open hole in the lower sand at 4249-87 feet, and will plug back for completion through perforations opposite lime pay at 4069-112 feet. Mudge Oil Company's Baldwin 1, Thomas McMeary Survey and northeast offset to the discovery, set pipe for completion, and rig was skidded 933 feet south to drill Baldwin 2. Oil from this and the nearby Lawson field is shipped by Toronto Pipe Line Company to Canada.

Cooke County: The Texas Company's Gainesville National Bank 3, T. W. Ward Survey and southeast offset to its discovery for the Northwest Walnut Bend field, depleted Ellenburger production at 5400-81 feet, and opened new Strawn sand zone in plugging back for perforations at 4490-515 feet. The well flowed 293 barrels of 38.9-gravity oil, with gas-oil ratio 91/1, initial through 11/32-inch choke from the new pay.

Montague County: Continental Oil Company's Magee 1, C. A. Wright Survey A-1052 and 3 miles southeast of Montague, is a prospective discovery with oil showings in the Strawn and conglomerate beds of the Bend. Pipe was set at 6460 feet after drilling to 6640 feet in Barnett, topped at 6576 feet, to try for completion in conglomerate at 6473-94 feet. Strawn oil-saturated sand at 6018-40 feet affords the best production prospect. This wildcat entered the Bend at 6228 feet and Marble Falls at 6536 feet, with elevation 1058 feet.

Continental's Fowler 1, southeast of its Lewis-Stuart field discovery, pumped 110 barrels of 41-gravity oil and 73 barrels of water initial from perforations at 6351-62 feet in Bend, topped at 6162 feet. The Texas Company's Great Southern Life 1, west offset to the discovery, was setting pump unit after swabbing 55 barrels of oil and 60 barrels of water initial from perforations at 6218-25 feet. These wells were drilled to Marble Falls at 6524 and 6577 feet, respectively, and were preceded by 2 prolific completions.

Gordon Calder Named Head of Southern Production Company

Gordon Calder, formerly vice president, was named president of Southern Production Company at the March 22-31 meeting of the directors.

E. P. C. Henery was reelected chairman and other officers named were J. M. Starke and Roy Williamson, vice presidents; H. T. Elwood, secretary-treasurer; Al. P. Barnes, assistant treasurer; and Bent B. Speaker, assistant secretary. Calder is moving to Shreveport to assume his new duties.

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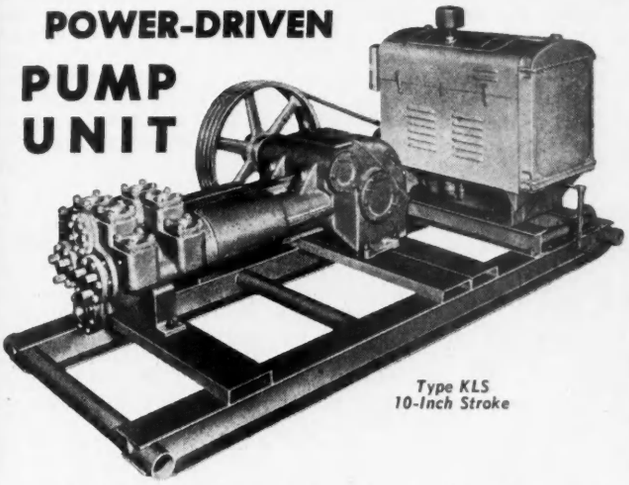

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• East Texas

Northeast Offset to Boynton Discovery Correlates High

Second test in Boynton field correlates high; wildcat and semi-wildcat in Houston County have nominal shows; wildcats fail in Bowie and Houston counties.

Smith County: Phillips Petroleum Company's Curry-Opal 1, J. A. Malone Survey and northeast offset to the Boynton field discovery in the Paluxy, was drilling at 6260 feet, having entered the Woodbine at 5130 feet and Buda at 6080 feet, with elevation 476 feet. This confirmation well correlates 40 to 50 feet high on these markers.

Houston County: M. H. McMurrey and The Texas Company's Smith 1, J. G. Thompson Survey and a semi-wildcat for the Navarro Crossing field, but separated by a failure, entered the Woodbine at 5855 feet and showed gas and distillate with rotary returns. However, a drill-stem test at 5866 feet proved dry, and the prospect was drilling water sand at 5890 feet.

Magnolia Petroleum Company's Ground 1, 6 miles southeast of Grapeland, was drilling at 8995 feet in Upper Glen Rose, topped at 8232 feet, with oil showing with rotary returns from sand beds at 8941-45 feet.

Continental Oil Company's Texas Long Leaf Lumber Company, Creek prospect, was abandoned at 8530 feet in Woodbine, topped at 7925 feet.

Bowie Couny: Tide Water Associated and Seaboard's Dalby & Joiner 1, D. Puckett Survey, was abandoned at 4825 feet in Paluxy, topped at 4521 feet.

Smackover Tests: Texas' White 1, Fairfield area, Freestone County, was drilling lime and anhydrite at 13,825 feet. In Wood County, Shell Oil Company's Goldsmith 12, Quitman field, was drilling sand and shale at 10,920 feet, while Humble Oil & Refining Company's McKnight 1, Hawkins area, was logging the same formations at 12,245 feet.

Wood County: R. J. Caraway et al's Mullinax & Martin 1, Mary Polk Survey and a Travis Peak prospect, was drilling lime at 6875 feet in Georgetown, topped at 6150 feet. Humble's Little Sandy Club 1, northwest edge of the Hawkins field, failed to encounter additional showings in drilling at 9110 feet.

Cherokee County: Standard Oil Company of Texas' New Birmingham 1, discovery that has been in process of completion for several months, tested 3½ million cubic feet of gas daily, with ½ barrel of 48-gravity distillate hourly through 3-16-inch choke after acidizing Bacon perforations at 8608-52 feet.

Delta Drilling Company and Al Brown's Lester 1, John Russell Survey, entered Barren Travis Peak at 9035 feet, and was drilling at 9150 feet without shows.

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Landmen Elect

M. V. Rushmore, of the land department of Gulf Oil Corporation at Oklahoma City, was elected president of the new Oklahoma Landmen's Association. Cecil Lanier, Magnolia Petroleum Company, is vice president, and Charles Schock, Stanolind Oil & Gas Company, is secretary-treasurer. Directors include J. H. Dalton, Anderson-Prichard Oil Corporation; Les Eastman, Phillips Petroleum Company; C. W. Horstmeier, Sinclair Prairie Oil Company; W. H. Jones, Stanolind Oil & Gas Company, and Tarz Marsh, The Carter Oil Company.

• East Texas Border

Harrison County Wildcat Has Good Oil Show in Travis Peak

Harrison County wildcat logs good show of oil in Travis Peak sand; Lassater field test gets show of gas in drill-stem test.

Harrison County: Arkansas Fuel Oil Company's M. C. McCauley, Sr. 1, P. Dougherty Survey, which shows indications of making a Travis Peak sand discovery, is nearing contract depth of 6800 feet and is moving production string to location in preparation for production tests. Last reported core from 6453-62 feet recovered hard tight sand and red and gray sand shale with no shows. A 45-minute drill-stem test at 6441-53 feet recovered 1170 feet of 40-gravity oil and 60 feet of oil-cut mud with no formation water. Solid oil sand was logged at the interval in which the test was taken.

E. C. Johnston's wildcat, Edna Hood 1, Lucinda Wallace Survey, 5 miles south-southwest of McCauley 1, ran electrical log at 6475 feet, total depth, and was setting 5½-inch casing for production test.

Marion County: Magnolia Petroleum Company's Hall Estate 1, Miles Moody

Survey, second test in the Lassater field, took a drill-stem test of perforations at 8762-72 feet with packer set at 8725 feet, using ⅜-inch bottom and ¼-inch top chokes. Gas hit the surface after 50 minutes. Tool was left open 2 hours. Recovery was 5 stands of salt water and 3½ stands of mud with a showing of gas. The well went to 10,241 feet and is plugged back to 8774 feet. Operators have been trying to eliminate formation water.

San Augustine County: M. E. Davis' W. A. Johnson 1, wildcat in Edmund Quirk Survey, is below 7510 feet. Cores from 6850-55 feet recovered dense limy shale.

• South Central Texas

Charlotte Field Production Extended 1½ Miles North

Humble extends Charlotte production 1½ miles; Rock Springs area wildcat abandoned; Del Monte field test abandoned.

Atascosa County: Humble Oil & Refining Company's J. B. Henry 1, outpost 1½ miles northeast of Charlotte field, J. Poitevent Survey 5, is waiting on potential after flowing an estimated 27½ barrels of oil daily through ¼-inch choke. Total depth is 5245 feet with 5½-inch casing set to 5150 feet and completion being from open hole in the Navarro sand. This discovery extends Charlotte production across Charlotte townsite and opens a large new area to development. The well is 350 feet from the northwest line and 2400 feet from the northeast line of the survey.

Edwards County: Ray Pool's Joe Sid Peterson 1, wildcat 20 miles north of Rock Springs, prepared to abandon after drilling to total depth of 4950 feet. The well has 5½-inch casing set to 4350 feet and open hole was acidized in an attempt to obtain production. Wash water and a little free oil with salt water were swabbed from the open hole. The Ellenburger was topped at 4425 feet.

Zavala County: The Texas Company's Cross S. Ranch Company 2 (Tract 1), at Del Monte field, has been abandoned as a dry hole. Total depth is 3907 feet. One drill-stem test was made at 3388-95 feet and recovered 90 feet of mud and 1080 feet of salt water in 30 minutes with working pressure of one pound. This hole is 1320 feet northeast of the No. 1 discovery.

• Southwest Texas—Lower Coast

Production Tests Under Way In Starr County Wildcat

Production tests made in Starr County wildcat; Skelly wildcat in Agua Dulce vicinity is oil discovery; new pay discovery at Stratton has oil in middle of gas-condensate production; gas flow gauged in wildcat near Casa Blanca.

Starr County: Production tests were being made in Dee Davenport's Fee-State 2, wildcat 2 miles north of Frost field and 13 miles northwest of Sullivan City. Casing is set to total depth of 4204 feet. Prior to setting pipe a drill-stem test at 4167-78 feet recovered 500 feet of oil with 70 pounds working pressure in 20 minutes. Another test at 4178-

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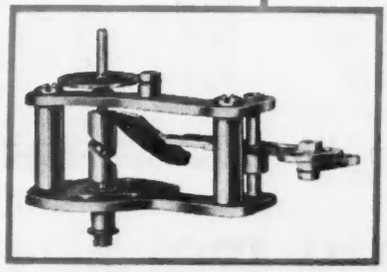

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88 feet recovered 640 feet of oil in 20 minutes with 90 pounds working pressure. Still another test at 4188-94 feet recovered 420 feet of oil in 20 minutes with 50 pounds working pressure. Operator has made location for Davenport-State 3, 933 feet west of No. 2 oil discovery. No. 2 well is 2300 feet northeast of the No. 1 gas discovery.

Nueces County: Skelly Oil Company's W. C. Rivers 1, wildcat 1½ miles southeast of Agua Dulce and 1½ miles west of Agua Dulce field, is an oil discovery for the area. The well flowed an estimated 80 barrels of 39-gravity oil daily while cleaning from perforations at 5995-6004 feet. Total depth is 7358 feet with 5½-inch casing set to 6066 feet. This flow had some gas and salt water and perforations are to be squeezed and casing will be reperforated at approximately the same level for completion.

G. E. Sullivan's Fee 1, oil discovery in the middle of gas-condensate production at Stratton field, flowed on potential 32 barrels of 43-gravity oil daily on 5/32-inch choke. Tubing pressure was 50 pounds and casing pressure 210 pounds, gas-oil ratio being 971/1. Total depth is 7020 feet with 7-inch casing set on bottom and perforated for completion at 5875-87 feet. Top of this pay zone was called at 5855 feet.

Duval County: Magnolia Petroleum Company's Duval Ranch-State 1 (Sect. 76), gas discovery 2 miles south of Casa Blanca field and 4 miles west of Government Wells field, gauged 4½ million cubic feet of dry gas on open flow while testing. Flow was from the Cole sand at 1323-35 feet, total depth being 2341 feet with 5½-inch casing set to 1350 feet.

• Middle Texas Coast

Victoria County Discovery Made in Heyser Field Area

Oil field discovered in Victoria County; oil tested from Wilcox in deep Dirks field well; West Cosden-Wilcox outpost sets casing; production tests made in Calhoun County wildcat.

Victoria County: Amerada Petroleum Corporation's Alexander Unit 1, wildcat in Bloomington townsite about a mile northwest of Heyser field and 1½ miles northeast of North McFaddin field, is an oil discovery. On a 10-hour test of perforations at 4904-09 feet the well flowed 97.3 barrels of 22.3-gravity oil with tubing pressure 525 pounds, casing sealed. Flow was through ¼-inch choke for the first 3 hours, through 3/16-inch choke for the next 6 hours, and through ⅛-inch choke for the last hour. Total depth is 6921 feet with 5½-inch casing set to 4973 feet. Perforations will be squeezed and a sand with oil show higher in the hole will be tested.

Bee County: Dirks Brothers & Tide Water Associated Oil Company's Page Estate 1-B, northwest flank of Dirks field, had oil show in a drill-stem test of a Wilcox sand at 7428-36 feet. The test flowed oil in 35 minutes with 175 pounds working pressure. Total depth is 7500 feet with casing set on bottom. There is no other Wilcox production in this field, which has been producing from the Pettus sand at approximately 3800 feet.

The Texas Company's Ernst Gremmel 7, outpost 2200 feet south of Mackhank Petroleum Company's Walton 1 discovery at West Cosden-Wilcox field, has run casing and will make production tests. A drill-stem test at 7048-57 feet prior to setting casing flowed in 29 minutes and flowed for an hour and 20 minutes after tool was closed. A recovery of 1440 feet of 33.1-gravity oil was made. Total depth is 7057 feet. The test is in the west corner of a 353.1-acre lease in John Pace Survey A-246.

Calhoun County: Production tests were being made in Ryan Consolidated Petroleum Company's Wagener 1, wildcat 2 miles east-northeast of Green Lake townsite. Casing has been set to total depth of 6097 feet with tests to be made near bottom.

• Upper Texas Coast

Southwest Flank Production Is Opened on Boling Dome

Southwest flank production opened on Boling Dome; Grubb & Hawkins' discovery completed for good gauge; North Port Neches production moves west; Altair production extended ½ mile east.

Wharton County: Cecil Hagen has opened flank production on the Boling dome 6000 feet from production. A. C. Mick 1, south-southwest flank of the structure, S. F. Austin survey, cleaned at the rate of 120 barrels of 29.6-gravity oil daily through ⅛-inch choke. Flowing pressure on tubing was 650 pounds and on casing 800 pounds with estimated gas-oil ratio 500/1. Total depth is 5114 feet in Vicksburg shale with 5½-inch casing set on bottom and perforated in the Frio at 5062-66 feet for completion. The sand is near the bottom of the Frio section, top of the Vicksburg being called at 5110 feet. This discovery bears out a prediction in an article by Cecil Hagen and Ralph Cantrell in the September 16, 1946, Gulf Coast Issue of THE OIL WEEKLY in which the authors declared additional oil would be discovered on the flanks of known salt domes.

Grubb & Hawkins' Rudolph C. Peters 1 has been completed as an excellent producer and as the discovery well of a new field. Located southwest of Lakeview-Hutchins field and east of North Louise gas field, the well flowed on potential 168 barrels of 22.8-gravity oil daily through 10/64-inch choke with tubing pressure ranging from 490 to 660 pounds and with gas-oil ratio 505/1. Total depth is 5503 feet with 5½-inch casing set to 5147 feet and perforated at 4520-24 feet for completion.

Orange County: Production at North Port Neches field has moved west with the completion of Gulf Oil Corporation's C. K. Akers 3, located 1251.8 feet west-southwest of Akers 2. On initial test the well flowed 159 barrels of oil daily through ⅛-inch choke with tubing pressure of 2400 pounds. Total depth is 9000 feet with 5½-inch casing set to 8860 feet and perforated for completion at 8776-78 feet.

Colorado County: Warren Petroleum Corporation's H. C. Miller 2 has extended production at Altair field ½-mile east. On potential the well flowed 49 barrels of 53.3-gravity condensate and 944,000 cubic feet of gas daily through 9/64-inch choke. Tubing pressure was 1420 pounds and casing pressure 1550 pounds. Total depth is 10,320 feet with casing perforated at 10,226-54 feet for completion.

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• South Louisiana

Weeks Island Producer Being Finaled at New Record Depth

Weeks Island well being completed at new world's record producing depth; Magnolia to abandon Gulf of Mexico wildcat on lease 673; attempt made to complete Alliance well in oil sand; Bayou Choupique well tests for completion.

Iberia Parish: Shell Oil Company, Inc., was completing Smith-State 3, Unit 1, Weeks Island field, at a new world-record producing depth. Drilled to total depth of 14,397 feet, 7-inch casing was set to 13,345 feet and 5-inch below that to 14,395 feet. Casing was perforated at 13,867-73 and 13,878-88 feet and squeezed with plastic. Casing was then perforated at approximately 13,875 feet for completion and the well flowed 479 barrels of 33-gravity oil daily through 10/64-inch choke with gas-oil ratio 1238/1. This producing depth is approximately 100 feet deeper than the previous record, held by the Smith-State 2, also in Weeks Island field.

Terrebonne Parish: Magnolia Petroleum Company was reported ready to abandon State 1, Mineral Lease 673, wildcat in the Gulf of Mexico 6 miles from Point Au Fer field. Bottom of the sidetracked hole is 11,714 feet.

Plaquemines Parish: The California Company was completing Louisiana Citrus Lands 2, Alliance field, located 1400 feet from the No. 1 gas well. Total depth is 9744 feet with 5½-inch casing set on bottom and perforated for completion at 9733-38 feet. This well is apparently attempting to complete in the sand from which No. 1 initially flowed 38.7-gravity oil but died. No. 1 subsequently was completed at the 9300-foot level as a gas well.

Calcasieu Parish: Union Sulphur Company's W. T. Brannon 2, 16-11s-10w, Bayou Choupique field, ¾-mile northwest of the Brannon 2 dry hole, was testing for completion. Total depth is 9059 feet with 5½-inch casing perforated at 8593-8603 feet. This sand is at the same level at which J. G. Gray Estate 1 was completed. Gray 1 flowed gas and condensate at the rate of 21½ barrels of condensate and 1,998,000 cubic feet of gas daily through 8/64-inch choke.

Regional Meeting of SEG Is Scheduled at Houston

A regional meeting of the Society of Exploration Geophysicists will be held at the Rice Hotel, Houston, Saturday, April 19. Cecil H. Green, Geophysical Service, Inc., president of the society, has announced, the program will include: A group of three papers on methods of surveying the continental shelf by the use of Shoran, radar and the Decca systems; two papers on automatic land surveying methods; and a paper by Gulf Research and Development Corporation on the development and operation of the airborne magnetometer.

Papers will cover the geochemical history of the Hardy field, Jones County, West Texas; the geophysical history of Lake St. John field, Concordia and Tensas parishes, Louisiana, and the geophysical history of the Anahuac field, Chambers County, Texas Gulf Coast.

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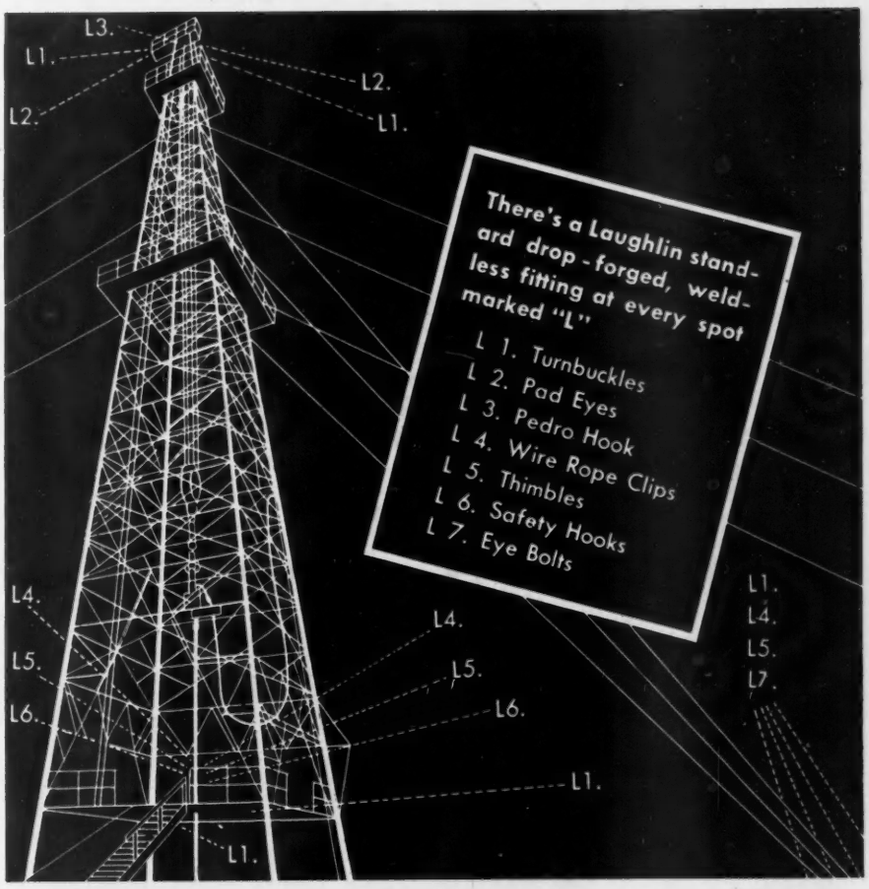
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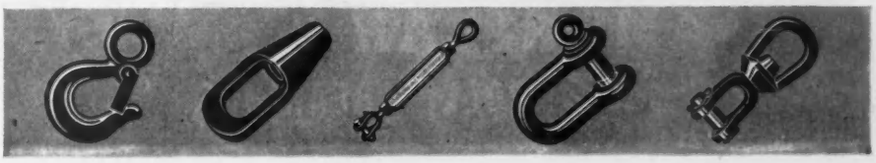

• North Louisiana

Wildcat in Delhi Area Logs Good Gas-Distillate Show

Delhi area wildcat reported to have logged gas-distillate; Madison Parish wildcat checking high on structure; De Soto wildcats test gas and oil.

Richland Parish: C. H. Murphy, Jr.-Sun Oil Company's Federal Land Bank 1, NE 10-17n-9e, stratigraphic wildcat test 1¾ miles north of Delhi production, was reported to have logged a good show of gas-distillate. No details have been released other than that production string has been cemented and tests were getting under way.

J. Brown Cutbirth et al's T. C. Neilson 2, SW SW 29-17n-9e, on a 40-acre tract in the Delhi area, previously drilled to find a pinched-out sand, was flowing 100-125 barrels of oil per day through 9/64-inch choke. Perforations were made at 3248-50 feet opposite saturated oil sand. Total depth is 3577 feet.

Madison Parish: Victor Grage's Madison Parish School Board 1, 35-18n-13w, 8 miles northwest of Tallulah, topped Gas Rock at 3890 feet and prepared to take a core. The well is checking 100 feet high on structure, considered very favorable to its prospects, and is attempting to find a pinchout with production from either Paluxy or Tuscaloosa sands.

De Soto Parish: A. W. Phillips' G. W. Sample 1, 12-13n-14w, tested perforations at 2845-55 feet and recovered gas, slight traces of oil and some water. The wildcat has been squeezed and is waiting to retest.

Skelly Oil Company's Thelma Nash 1, SW NE 20-12n-16w, apparently has found oil production on the north flank of the Logansport gas field. A core from 6104-16 feet recovered lime with good odor and stain, and a drill-stem test at 1606-16 feet recovered 150 feet of pipe line oil and 60 feet of oil-cut mud. Another test of 6115-28 feet recovered drilling mud with slight trace of oil. Drilling continues and is now below 6310 feet. The well will be carried to the Travis Peak before casing is set.

Natchitoches Parish: The California Company's request to drill a deep Rodessa test in the Ashland field, A. R. Johnson et al 1, 1-13n-8w, has been denied as was another permit to drill to the "Detro" pay. No drilling will be permitted in the area until after a hearing to be held in New Orleans April 15 on adoption of networks of units for the exploration and production of the "Detro" or 3300-foot pay.

Spacing Extension Asked

Application has been filed with the Oklahoma Corporation Commission by Anderson-Prichard Oil Corporation for extension of 40-acre well spacing and drilling units in the Southwest Antioch area of Garvin County. Hearing has been set for May 6 at 10 a.m. in Oklahoma City.

• Arkansas

Ouachita County's Pace City Field Has First Flowing Well

Pace City field gets first flowing well; Spirit Lake outpost tests dry; Midway field gets good oil producer; Village field failure reworked and completing from Travis Peak pay.

Ouachita County: Charles Wampler's Josie Smith 1, C NE SW SW 30-15s-17w, became the first flowing well in the Pace City field. It gauged 192 barrels of 28-gravity oil per day through ¼-inch choke on tubing from perforations in the Tokio at 2787-96 feet. Total depth is 3998, with 7-inch casing cemented at 2815 feet. The producer is a west offset to the field discovery.

Lafayette County: Magnolia Petroleum Company's southwest outpost to Spirit Lake production, Lester Brothers 1, C NW NE 22-16s-25w, tested dry from perforations at 2915-35 feet. Acid treatment failed to improve the tests and perforations were squeezed. Total depth is 5467 feet with 7-inch casing bottomed at 4037 feet.

Barnsdall Oil Company's Clyde Beck 2, C NE NW NW 14-15s-24w, Midway field, was completed flowing 670 barrels of oil daily through ¼-inch choke. Smackover lime was treated with 750 gallons of acid from 6470-80 feet, total depth. It was an open hole completion.

Columbia County: E. G. Bradham and C. B. Ragsdale's Gunnell 2, SE NE 16-17s-19w, Village field, which was drilled to 7434 feet and abandoned in April, 1937, by Standard Oil Company of Louisiana, has been reworked and completed from the new Travis Peak pay found in the field last year. The well flowed 165 barrels of oil daily through 9/64-inch choke from perforations at 4765-75 feet.

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• Mississippi

Wildcat Activity Is Brisk; Shows Reported in Two Tests

Wildcat activity running heavy; slight shows reported in 2 tests.

Jefferson County: The Ohio Oil Company's Hard Times Plantation 1, NEC 35-8n-1w, was drilling at 7980 feet after running continuous core tests without results. Slight oil stain and odor were encountered in sand and shale at 3811-21 feet in what is probably a Wilcox section, but below that salt water began to show up. No shows have been reported in the lower horizons. E. E. Fogelson & Phil E. Laughlin's Jefferson County Bank 1, NWc 4-9n-2e, has been abandoned at total depth of 10,122 feet in the Massive sand zone with no shows indicated.

In the Fayette field, Humble Oil & Refining Company's M. R. Smith 2, 10-9n-1e, was running further core tests although results obtained in the Lower Tuscaloosa productive section have been fair. In a drill-stem test at 9661-75 feet 270 feet of oil and 150 feet of salt water were recovered in 20 minutes. Cores from 9675-85 feet revealed a thin stringer of oil sand.

Marion County: Humble's C. Tullos 1, SWc 12-1n-18w, has indicated slight shows in Lower Tuscaloosa section cores at 9027-44 and 9044-56 feet. A drill-stem test of the Upper Tuscaloosa zone at 8278-92 feet had previously recovered only mud and salt water. Sand in the Lower Tuscaloosa showed slight porosity. Driller was attempting to develop shows with a drill-stem test under way.

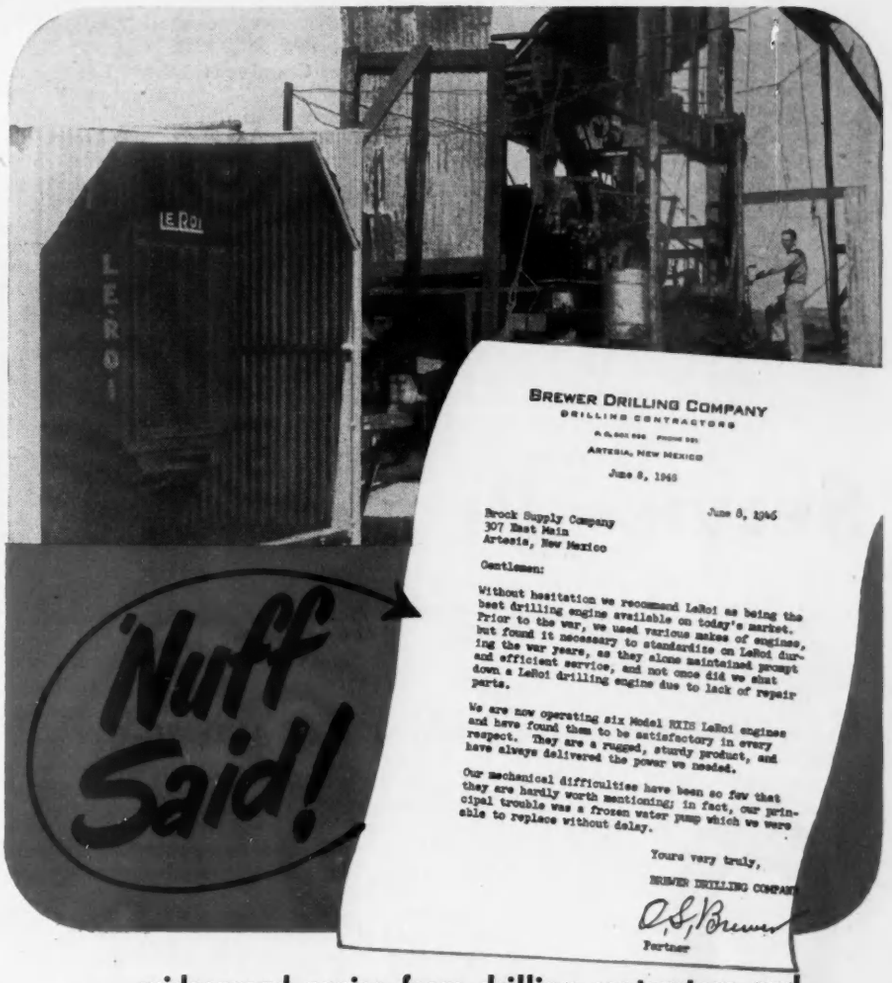
Jones County: Gulf Refining Company's L. L. Majors 1, SEc NE 29-6n-11w, deep wildcat, was below 10,965 feet in shale with lime stringers. Cores from 10,028-115 feet recovered porous sand with slight odor and fluorescence. Cores from 10,182-464 feet recovered no shows in sand.

Amite County: Gulf's J. A. Rowland A-1, SWc NW 39-4n-2e, wildcat, was preparing for further tests of horizons below 10,575 feet. In a drill-stem test with packer at 10,685 feet the well flowed water cushion for six hours and then recovered mud slightly cut with gas. Section was being reperforated at 10,575,80 feet.

Clay County: The Atlantic Refining Company's R. G. Dunning 1, SWc 12-19n-16e, wildcat in the northeast section of the state, was at 4967 feet with no shows reported so far.

Lincoln County: Rogers Lacy's Harvey Smith 1, SE NE 17-6n-7e, wildcat heading for the 10,000-foot level was drilling at 6978 feet. Cores of the Wilcox section at 4058-78 feet recovered no shows. In the Brookhaven field another successful completion has been recorded with Roeser & Pendleton's Day Unit 1, NE NW 20-7n-7e. In its initial test the Day flowed 882 barrels of 38-gravity oil per day from perforations between 10,432-67 feet in the Massive sand zone. The field is now the most active in the state with 41 tests under way.

Adams County: The California Company's Robert Johnson 1, 47-7n-1w, Cranfield field, was preparing to complete from the Wilcox zone after flowing 24 barrels of oil in 17 hours from perforations at 5762-64 feet. Gas lift will be installed. In the LaGrange field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Sohio Petroleum Company-Big Chief Drilling Company's R. Lee Parker G-1, SEc 36-6n-2w, has been successfully completed from the 6200-foot sand of the Wilcox with an initial production of 111 barrels of 38.6-gravity oil per day.

Alabama

Only active well in the state was Hunt Oil Company's T. R. Miller Mill Company 5, NW NE 1-4n-11e, wildcat in Conecuh County. It is below 7852 feet with no shows reported.

Florida

Humble Oil & Refining Company's Tuscon Corporation 1, SWc 35-43s-40e, wildcat in Palm Beach County, ran electric log at 8730 feet. Cores from 8336-81 feet recovered dolomite and anhydrite with no shows indicated. Drilling continues below 8801 feet.

Collier County: Humble's Lee Cypress 3, SE SE 28-47s-29e, wildcat in the Sunniland area, is drilling below 11,428 feet. Cores from 10,349-59 feet recovered stringers of lime in anhydrite. Slight shows of oil had been recovered in cores from 9950-54 feet.

In the Sunniland field, Humble's Gulf Coast Realty 9, C SE¼ 24-48s-29e, was preparing to test after running gamma ray logs to 11,579 feet. A drill-stem test at 11,581-95 feet, total depth, had slight blow and recovered mud cut with oil and salt water.

Humble's other Sunniland test, Gulf Coast Realties 5, C SW SW 20-48s-30e, is below 9602 feet in lime and dolomite.

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• California

Tests for Production Made By Fresno County Wildcat

Fresno County wildcat tests for production; first tests of Bacon Hills wildcat inconclusive, but good well expected; lower portions of 2 Kern County deep tests being abandoned; second Alondra field producer expected; another well completed in East Los Angeles field.

Fresno County: Sharples Corporation has set casing on plug at 8380 feet in Hyde 1, wildcat in 6-19s-16e, a mile north of production in the Amerada area of the East Coalinga Extension and will gun-perforate for production. Oil sand was reported at 8278-8326 feet but drilling was continued to 8900 feet before a test of the sand interval was decided on. This is the first well to be drilled by Sharples in California.

Union Oil Company has staked Waechter 44-32, northwesterly offset to The Superior Oil Company's recently completed Hackala 55 in 32-15s-17e, discovery well southwest of Raisin City. Superior is drilling Keisson 35-32 below 7000 feet about ¼ mile west of the discovery.

Kern County: Shutoff tests in Seaboard Oil Company's Seaboard-Bandini 3-21 in the Bacon Hills area, 21-28s-20e, were inconclusive. Outlook for the discovery is considered excellent as earlier tests produced a substantial quantity of 36.7-gravity oil from the Oceanic sand at 7855-80 feet.

Belridge Oil Company has abandoned its South Belridge deep test, 62-W-33, below 9400 feet and will test above by stages. Operator has been working on the well for nearly 2 years. It was drilled to 14,104 feet and when casing was set at 13,945 meet several months ago it was the subject of considerable speculation, but later tests proved unsuccessful. Location is in 33-28s-21e, 2 miles southeast of General Petroleum Corporation's Berry 1, wildcat in 30-28-21, which broke the world's depth record at 11,377 feet in 1934. This well had interesting oil showings but mechanical difficulties prevented a satisfactory production test.

Pacific Western Oil Corporation has abandoned the lower portion of its National Royalties 1 in the Miramonte area, 5-26s-22e, with drill pipe fish in the hole from 12,000 feet to bottom at 16,668 feet. The company will gun-perforate for a test of showings between 11,930 and 12,150 feet.

Doubt was cast on the importance of the recent oil discovery in the McDonald Anticline area by Honolulu Oil Corporation and Wilshire Oil Company, when their joint discovery well, Layman 1 in 18-28s-20e, died after flowing 205 barrels a day completion. It has been placed on the pump and was making 27 barrels, 18.3-gravity, 92 percent cut. Production is from the button beds horizon.

Yolo County: Standard Oil Company of California will drill Campbell Community 1, a natural gas test, in 18-8n-2e. Location is 3 miles west of Davis and about 5 miles from the Winters and Fairfield Knolls gas fields.

Kings County: Pacific Central Oil Company has made locations for 2 outpost tests north of the Trico gas field. J. W. R. 1 will be drilled in 31-23s-23e and J. W. R. 2 in 35-23s-22e. The former

location falls in Tulare County. Completion of an additional pipe line into the Trico gas field has been responsible for much of the recent drilling activity in this area.

Los Angeles County: The British American Oil Producing Company was making production trials in Bodger 3, Alondra area, 22-3s-14w. A good producer is considered probable as the well is only 600 feet from this operator's Bodger 1 discovery brought in last summer. Other wells drilled in the area have been failures.

Richfield has staked 'Edison 2 in 16-2s-12w in the East Los Angeles field as an offset to its U. P. Unit 4, which has been completed flowing 400 barrels of 43-gravity oil through a 22/64-inch choke.

Pioneers to Meet

The California Petroleum Production Pioneers will hold a barbecue and general roundup of Valley pioneers May 3 at the Kern County Golf Club, just north of Bakersfield. Arrangements are in charge of Ox Morgan, Larry Coker and Lou Bronzan.

• Michigan

Sun's Well Has Best Yield Found in Kimball Lake Area

Kimball Lake well, Newaygo County, yields best production found in play; West Monterey pool, Allegan County, extended; Pinconning area, Bay County, has 14th failure in mile radius of discovery.

Newaygo County: Sun Oil Company's Ville 1, NE SE SE 10-12n-13w, 1320 feet northwest of the Kimball Lake pool discovery, flowed 182 barrels of oil on 3-hour test from Traverse lime pay at 2323-26 feet for the best production found in the play. Four more starts have been authorized. First tests by Sun on Anderson 1, NE NW NW 14-12n-13w, southeast offset to the discovery for oil production in the Monroe at 2865-903 feet failed to show probable commercial results. Swabbing operations were being continued. Cores showed some oil saturation.

Allegan County: Lang and Devine's Ochampaugh 1, NE NW SW 17-3n-13w, ½ mile north of the West Monterey pool discovery, was estimated good for 300 barrels per day and up from a Traverse pay, following preliminary tests. Flowing pay was logged at 1681-83 feet with production up to 50 barrels per hour. Test already has caused 3 new locations and it may produce another typical shallow well flurry in the township where 6 pools have been developed in 9 years.

Bay County: Another attempt to establish a field in the Fraser-Pinconning area failed when J. O. Mutch's Paterek 1, SE SE NW 2-16n-4e, drilled Dundee objective dry at 3001 feet. It was the 14th failure within a mile radius of Shell Oil Company's Kurjea 1 discovery. Shell's well still is the only oil producer in the area. Shell completed the discovery 3 years ago and it has continued to flow steadily at a pinched rate of 100 barrels per day since completion. Production is from the 2900-foot Dundee dolomite section.

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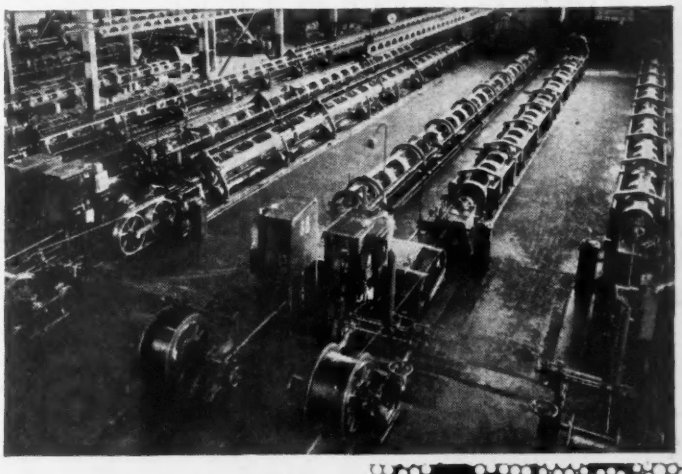

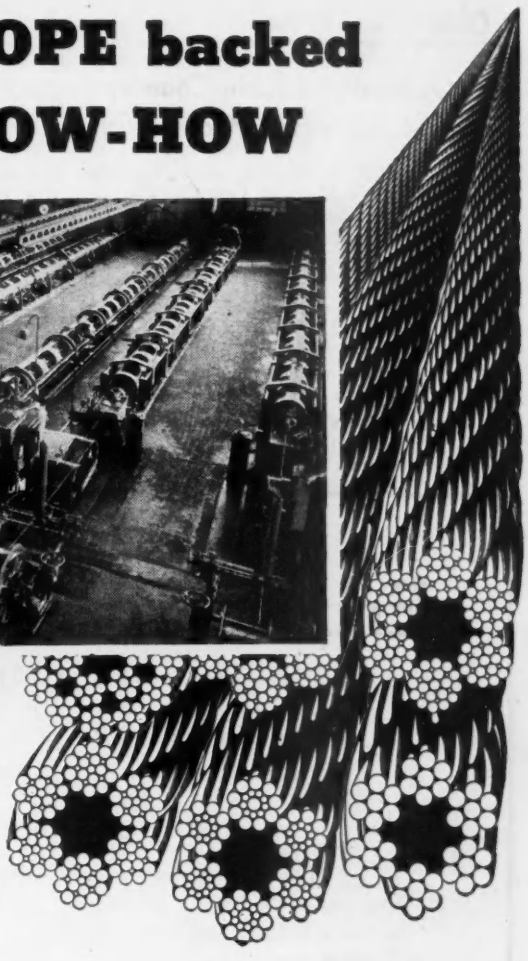

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• Ohio

Pool Opened in Lorain County; Morgan County Has Medina Well

Pool opened in Wellington; Medina sand produces in Morgan County; Hopewell pool extended; Chester wildcat to be drilled to Ohio shale.

Lorian County: The Ohio Fuel Gas Company's V. L. Young 1, Lot 5, Wellington township, reached the top of the Clinton sand at 2336 feet and at 3 feet in the well was flowing at the rate of 1,600,000 cubic feet when the bit was lost in the hole.

Morgan County: The first gas well in the Medina sand in Morgan County was completed by Ohio Fuel Gas when D. L. Jadwin 2, with only small shows of oil and gas in the Clinton sand, was drilled on down. Top of the Medina sand at 3928 feet was drilled to 3932 feet, where the well was tubed with a gauge of 720,000 cubic feet.

Perry County: A ½-mile extension to the Hopewell pool was opened by the Four Way Oil and Gas Company when Mary A. Walser 1, NE SE SE 27, came in with a good showing of oil. After shooting, the well made 80 barrels in 24 hours. Clinton sand was logged at 2885-913 feet.

Meigs County: Ohio Fuel's H. W. Ritchie 1, wildcat in Chester township, was dry in the Berea sand, 1733-39 feet, and will be drilled to the shale and shot.

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• Illinois Basin

New Pool Likely in Illinois' Bible Grove Pool Vicinity

Pool opener apparent in Effingham County, Illinois; Clay County wildcats appear to be producers.

Illinois

W. O. Schock et al's Schultz 1, SW SW NW 32-7n-7e, Effingham County, and 5 miles north of the Bible Grove pool, has set pipe to test Rosiclare sand at 2730-38 feet. A drill-stem test showed 50 feet of gas, 40 feet of oil and 390 feet of oil-cut mud in 2 hours. Gulf Refining Company is taking over the well to make further tests.

Clay County: National Associated Petroleum Company's Theobold 4-A, NW NW SW 17-3n-6e, is giving the North Kenner pool a new horizon. Pipe is set at 2906-18 feet to McClosky lime, which during a 1-hour drill-stem test showed 540 feet of oil and 240 feet of oil-cut mud.

J. J. Lynn's Stanford 1, NW NW SW 36-7n-7e, 1½ miles west of the Clay City pool, was testing after setting pipe to McClosky at 3085-90 feet. During a 1-hour drill-stem test, the well yielded 30 feet of oil and 145 feet of oil-cut mud.

White County: Nation Oil Company's Rudolph 1, NW NE NW 10-5s-10e, 2 miles west of the Phillipstown pool, swabbed 15 barrels of oil in 1 hour from Rosiclare at 3085-90 feet. Testing continues.

Wabash County: Cherry and Kidd have set casing for production test at Gray-Newman 1, NE NE SE 33-1s-14w, a southeast extension of the Browns pool. A 1-hour drill-stem test of McClosky lime at 2992-3016 feet, showed 100 feet of oil and 200 feet of oil-cut mud.

• Rocky Mountain Area

Pump Installed on Steamboat Butte Extensioner, Wyoming

Pump installed on Steamboat Butte field extension in Wyoming; second well has oil in Muddy sand; Continental gives up on Rangely well, Colorado; Utah deep wildcat to be plugged back.

Wyoming

Brinkerhoff Drilling Company of Dallas was installing pump on its extension test to the Steamboat Butte field after the well flowed more than 170 barrels of oil daily from the Tensleep. The well is Tribal 1, NW NW NW 9-3n-1w, (Wind River Meridian), Fremont County and a mile southeast of Tensleep production. During the week oil and gas leases on 820 acres of Tribal acreage south and west of the extension well were sold by the Wind River Indian Agency to Tide Water Associated Oil Company for approximately $129 per acre.

This well was drilled on a farmout from Sohio Petroleum Company and went to 6923 feet, total depth, in the Tensleep sand. The well had shows of oil in 6 sands from the Muddy to the Tensleep. There has been speculation that Steamboat Butte and Pilot Butte fields, three miles south, may join in production from the Tensleep sand. Both fields produce from the Tensleep, Steamboat Butte making 6000 barrels

of oil daily from 12 wells, and Pilot Butte producing 700 barrels daily from 4 wells. The British American Oil Producing Company is the principal operator in both fields.

Sinclair Wyoming Oil Company's Unit 7, SW SW NE 13-28n-93w, Crooks Gap field, is the second well to find oil in the Muddy sand. Muddy was topped at 4912 feet and on drill-stem test at 4952-5002 feet made 500 feet of 36-gravity oil with some gas. Drilling continues to the Dakota. Oil was first found in the Muddy in Unit 6, a mile southwest, but this well was also completed in the Dakota, where it made 1100 barrels on 12-hour initial test.

Carbon County: The Kerr-McGee and Phillips Petroleum Company test of the Baggs structure was preparing to make a final effort to obtain commercial gas in Tertiary sands before abandonment. The well is Unit 1, C SE SE 10-12n-92w, and went to 9512 feet in the Mancos shale before plugging back and making a series of tests between 3000-5000 feet. When the well was drilled the best results obtained on drill-stem tests were between 3760-85 feet, and this zone has not been tested at the present time. Water, with gas, was tested in all sands checked in the tests.

Washakie County: The General Petroleum Corporation was installing pump on its discovery well at South Fork, south of Worland. The well, No. 88-24-G, SE SE SE 24-46n-92w, has not been tested since it made 23 barrels of 29-gravity oil from the Embar formation at 10,055-126 feet, two weeks ago. The test was drilled to 10,900 feet before plugging back for an Embar completion.

Colorado

Continental Oil Company is abandoning the third dry hole in the Rangely field at Rooth 3, C NE NE 27-2n-103w, Rio Blanco County, on the west side of the field. This well topped the Weber at 6672 feet and was drilled to 7175 feet, total depth. Datum on the Weber was considered above the water level on the west side of the field, but sand conditions in the top of the formation had changed and no saturation was logged. Testing was continued for several weeks, but the well was finally plugged back and casing perforated opposite the Shinarump, 5955-6010 feet. This formation had shown a small amount of saturation, but after acidizing with 1000 gallons the well bailed only 2 barrels of oil in 4 hours.

Utah

The Carter Oil Company was reported preparing to plug back its West Vernal wildcat in Uinta County, northwestern Utah, after running electrical log to 8000 feet, total depth. The well is Davis 1, C NE NW 33-4s-20e, and was commenced last year following 2 years of geological and geophysical work in the area by Carter. A block of 60,000 acres in the district was unitized and the present well is the first of a series of wildcats planned for the Basin. Carter will now run casing to approximately 6000 feet and test a zone between 5830-974 feet. On drill-stem test when the well was drilled this zone tested at the rate of 3 million cubic feet of sweet, dry gas in 1½ hours. This test has been of importance as the first deep test in the Uinta Basin of Utah, west of Colorado's Rangely field.

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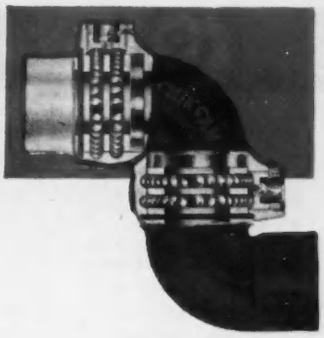

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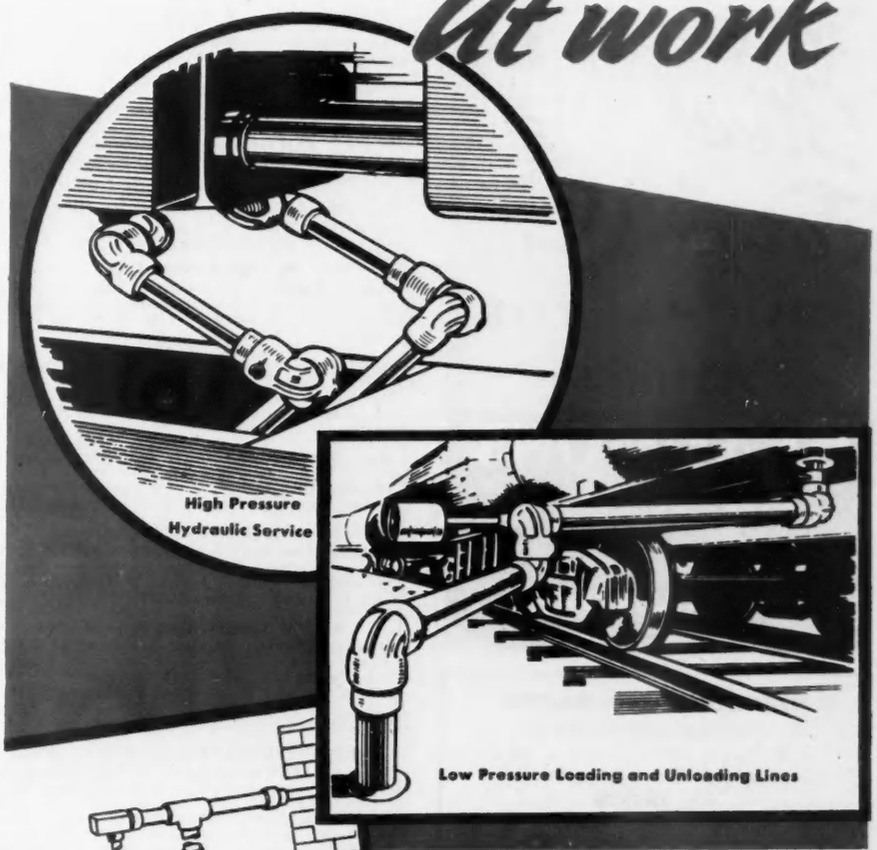

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EXPLORATORY FAILURES

ARKANSAS WILDCAT

Arkansas County: Ryan Consolidated Pet. Corp.'s Roy McCollum 1, c nw nw nw 24-2s-5w, Nacatoch 2980, Paleozoic 3529, abnd 3-27-47 at 3731.

ARKANSAS NEW PAY TEST

Nevada County—Irma Field: J. B. Downs' Groves Ld. & Tmbr. Co. 1, c se ne nw 1-14s-21w, Nacatoch 1040, Tokio 2000, James 2640, Travis Peak 2873, abnd 3-31-47 at 3160.

CALIFORNIA WILDCATS

Kern County: Bender Oil Operations' B. A. Co. 1, 29-30s-29e, Mt. View area, Basal Chanac Sand 6218, 1st Transition 5240, Wharton 5410, Carbonaceous Silt 5467, abnd 4-3-47 at 5497.

Harp and Brown's Quinn 1, 11-25s-27e, Jasmine area, abnd 3-22-47 at 2347.

MAGNETOMETER CONTRACTOR
Oil and Mining Exploration.
Standard Instruments and
Interpretive Methods.
VIC KARNES
Weiss Building Annex, Beaumont, Texas
Office Phone 2701 Home Phone 6915

PAGES 3945 THRU 3964 IN
THE COMPOSITE CATALOG

Independent Exploration Co.'s Richardson 2, 18-29s-21e, Cymric area, Media Sand 1613, Gray Carneros Sand 1818, abnd 3-25-47 at 3078.

Gene Reid Exploration Co.'s Marshal 1, 32-26s-28e, Mount Poso area, Vedder 1800, abnd 3-26-47 at 1842.

Seaboard's Garrison-Davis 1-5, 30-29s-29e, Magunden area, abnd 3-31-47 at 7646.

Tide Water's Tupman 23-9, 9-31s-29e, Arvin area, Santa Margarita 7107, Upper Fruitvale 7177, Lower Fruitvale 7510, Olcese 8741, Freeman 9064, abnd 3-30-47 at 9288.

Union Oil Co.'s Hopkins 87X-4, 4-29s-21e, S. Belridge area, base Tulare 1160, abnd 3-26-47 at 1800.

Tulare County: Lebow and McNee's Bolz 1, 19-24s-23e, Trico area, Mya 2480, abnd 3-23-47 at 3500.

Pacific Central Oil Co.'s Divizich 1, 13-24s-25e, Earlimart area, abnd 3-30-47 at 5636.

Los Angeles County: C. G. Willis' Butler Community 1, 15-2s-12w, Bandini area, abnd 3-29-47 at 6339.

San Luis Obispo County: Union Oil Co.'s Vernon Wineman 1, 19-11n-33w, Nipomo area, abnd 4-4-47 at 972.

COLORADO OUTPOSTS

Archuleta County—Chromo Field: Florence & Teague's Shalan 1, ne se.nw 4-32n-1e, abnd at 140.

Rio Blanco County—Rangely Field: Continental's Rooth 3, c ne ne 27-2n-103w, Shinarump 5955, Weber 6672, abnd 4-6-47 at 7175.

FLORIDA WILDCAT

Monroe County: Gulf's State 1, Lse 373, swc 2-67s-29e, Pliocene 50, Oligocene 834, Claiborne 1310, Sunniland lime 10,725, abnd 4-1-47 at 15,455.

ILLINOIS WILDCATS

Bond County: W. Vette's McCutchan 1, se sw ne 29-4n-4w, abnd 495.

Fayette County: Edgar W. White's Satterwait 1, ne nw nw 13-6n-2e, abnd 1721.

Jefferson County: Tom Doran et al's Mischke 1, nw ne nw 20-2s-1e, abnd 2306.

Macoupin County: Sun's Alford 1, n2 nw ne 3-9n-6w, abnd 2552.

Washington County: Chicago Pet. Corp.'s Schwengels 1, ne nw ne 25-2s-4w, abnd 1338.

KENTUCKY WILDCATS

Daviess County: Ty Schmidt's Gilles 1, 20-P-28, abnd 1330.

Henderson County: Loman & Johnson et al's Trigg 1-A, 14-P-22, abnd 2710.

NORTH LOUISIANA WILDCATS

Bossier Parish: Barnsdall-Stanolind-Sohio's Johnson 1, c ne sw se 30-23n-12w, 3 mi ne Plain Dealing, abnd 4-4-47 at 7510.

Winn Parish: B. E. Reid's Odus McCartney 1, 1520 fr wl 860 fr nl 26-10n-1w, 5 mi nw Rochelle, abnd 3-25-47 at 1538.

NORTH LOUISIANA NEW PAY TEST

Webster Parish—Cotton Valley Field: Cotton Valley Operator's Committee's Sam Banks 2, (OWDD) c se nw 34-21n-10w, "D" Sand 8123-40, Bodcaw 8220-37, Davis 8462-72, Bossier shale 9118, Smackover 10,320, otd 5792; perf 8458-92 in Davis sd, flow 9 mln gas, ¼-in, comp 3-30-47 at 8500, td 14,967.

MICHIGAN WILDCAT

Barry County: R. B. Tamblyn's Blackman 1, se sw ne 6-1n-9w, abnd 4-1-47 at 2321.

MISSISSIPPI WILDCATS

Jefferson County: E. E. Fogelson & Phil E. Laughlin's Jefferson Cty Bank 1, nwc 4-9n-2e, Wilcox 3726, Selma 8136, Tuscaloosa 9129, Mar. Tuscaloosa 9654, L. Tuscaloosa 9894, Massive sd 10,005, abnd 3-21-47 at 10,122.

Wayne County: Humble's G. M. & O. Land Co. B-2, nec 24-9n-8w, abnd 3-22-47 at 11,300.

OHIO WILDCAT

Lorain County: Glenn Harmon et al's A. J. Haist 1, se ne 16, Carlisle, abnd 4-1-47 at 2345.

WEST TEXAS WILDCATS

Dawson County: Ray Albaugh et al's Dorsey 1, (OWDD) c sw sw HE&WT 13, blk 33, T-7-N, OTD 4360, elev 2949, Grayburg 3590, abnd 3-30-47 at 4784.

Hockley County: Guy Mabee Drlg. Co.'s Ellwood-Humble 1, 440 out nwc lbr 18, lge 19, Wichita CSL, elev 3472, salt 2195, San Andres 4280, abnd 4-1-47 at 5360.

WEST CENTRAL TEXAS WILDCAT

Crockett County: Los Nietos Co.'s University 1, sw nw sw sect 30, blk 7, elev 2642, anhydrite 1000, salt 1073, solid lime 2814, abnd 3-27-47 at 3000.

NORTH CENTRAL TEXAS WILDCATS

Brown County: Roy H. Denhart-H. Dunkle's Hill 1, 450 snl 867 wel e½ sect 8, E. T. Ry. (S. P. Walker sur), abnd 3-1-47 at 900.

Haskell County: Anderson-Prichard Oil Corp.'s Terrell 1, 4583 snl 2367 ewl Elias Gilpin sur 132, elev 1528, base Valera 1065, base Coleman Junction 1430, Palo Pinto 3375, Strawn 4540, abnd 2-25-47 at 4980.

W. C. Estes and Wagoner's Brunstedt 1, 330 out sec blk 25, J. Scott sur 118, elev 1583, L. Strawn 4680, jkd and abnd 4-1-47 at 4702.

Jones County: Carl Hovgard et al's Reeves 1, se ne se sect 13, Blind Asylum Lands, elev 1723, abnd 3-24-47 at 2407.

North American Oil Consolidated's Arnett's 330 out swc S. P. Ry. 46, blk 2, elev 1807, abnd 3-17-47 at 3028.

West Central Drlg. Co. et al's Reeves 1, 330 w 1300 n of m/e/sec of M. R. Longerio sur 258, elev 1697, Gunsight 2577, Reef 3600, abnd 3-14-47 at 4286.

Shackelford County: A. R. Dillard et al's Ackers 1, 467 snl 1400 wel T&P Ry. 16, blk 13, elev 1779, abnd 3-21-47 at 3976.

NORTH TEXAS WILDCATS

Archer County: Neeld & Hood Drlg. Co.'s Kunkel 1, 500 snl 150 ewl blk 47, Meade Pasture, abnd 3-22-47 at 1477.

Reinhold & Genshorek's Wolfe 1, 150 snl 1550 wel M. H. Finch sur, abnd 3-20-47 at 2004.

Baylor County: Youngblood & R. L. Foree's Huskinson 1, sw se sw D&W Ry. 9, blk 1, abnd 3-26-47 at 1790.

Clay County: Gus Blakely et al's Yarbrough 1, 152 out swc blk 126, Buers sbdn, abnd 3-20-47 at 913.

Cooke County: Lloyd Oil Co.'s Daniel 1, 1330 nsl 330 ewl of 40-ac and M. J. Buckalew sur, elev 817, abnd 3-26-47 at 2501.

Virgil Taylor et al's Ramsey 1, 990 snl 330 wel of s½ M. French sur, abnd 3-25-47 at 2606.

Wichita County: Consolidated Oil Co.'s Daves 2, 150 out swc lbr 14, lge 2, Denton CSL, abnd 4-1-47 at 632.

EAST CENTRAL TEXAS WILDCAT

Limestone County: Allen Barton (was Dail Goodson's) Nance 1, 4160 fr swl 150 fr m/s/nwl of J. D. Brown sur, elev 443, Nacatoch 1204, Pecan chalk 2018-2220, Austin 2918-3228, Woodbine 3520, abnd 4-2-47 at 3665.

NORTHEAST TEXAS WILDCATS

Bowie County: Barnsdall & Sohio's Greenwood 1, 1250 ewl 5250 snl Lewis T. King sur, e of Eylau disc, elev 306, Tokio 2230, Goodland 2864, Trinity 3000, massive anhydrite 4396-4530, James 4930, Pettit 5146, Travis Peak 5240, Cotton Valley 6180, Buckner 7355, Smackover 7660, abnd 3-22-47 at 8188.

Panola County: Feazel & Kinsey's M. Cartwright 1, W. Morris sur, 136-ac lse, base Chalk 2255, Massive 5222-5450, upper Pettit porosity 6161-90, lower Pettit porosity 6338-70, temp abnd 3-27-47 at 6576.

Wood County: Bobby Manziel et al's Shamburger 1, 630 nsl 1845 wel W. H. Pool sur, Quitman townsite, elev 434, Sub-Clarksville 4648, abnd 3-29-47 at 5650.

SOUTH CENTRAL TEXAS WILDCAT

Bexar County: Mellie Pegg-Milton Pegg-W. H. Bode's H. & E. A. Lowe 1, 300 fr s&el 48.22-ac tr, J. H. Pickens sur 7, lot 21, blk 51, San Antonio Irr. Farms, abnd 3-25-47 at 985.

SOUTHWEST TEXAS-LOWER COAST WILDCATS

Duval County: J. W. Gorman's Farmers Life Ins. Co. 2, 990 fr sl 1650 fr el E. R. Gray sur 558, 320-ac lse, 3½ mi ne Loma Vista fld, 4½ mi w Strake fld, abnd 3-25-47 at 3466.

H. H. Howell's Otherlia Barton 1, 330 fr el 814 fr sl Seale & Morris sur 427, 80.56-ac lse, 2 mi ne Benavides fld, abnd 3-28-47 at 5119.

Ralph Rowden-Dale Rowden's John P. Akin et al 1, 330 fr nel 1764 fr nwl GB&CNG sur 186, 221-ac lse, 1470 s sw Cedro Hill fld, 2 mi ne E. Peters fld, abnd 3-26-47 at 3242.

Nueces County: Rand Morgan's Rand Morgan Fee 1-A, 467 fr sl 1400 fr el sect 7, Casa Blanca Gr, blks 3&4 sect 7, 1 mi n Richard King fld, 1 mi sw gas disc well at North King fld, abnd 3-20-47 at 5780.

Starr County: Continental's Dee Davenport 3, 330 fr nl 2310 fr el sur 532, 942.16-ac lse, 2 mi e Rincon fld, abnd 3-28-47 at 5753.

Webb County: Daubert & Achning's J. G. Garcia Heirs 1, 330 fr el 1320 fr sly/nl sur 463, 295-ac lse, abnd 3-27-47 at 1592.

MIDDLE TEXAS COAST OUTPOST

Bee County—Strauch-Wilcox Field: Mills Bennett's D. L. Schrock 1, 660 fr wl 1000 fr sl 160-ac lse, ne¼ sect 19, Rangleu sbdn, J. M. Uranga Gr, 3200 n ne Berger 1, Wilcox disc well, Pettus 3995, base Yegua 4852, Slick 7983, abdn 3-29-47 at 8190.

UPPER TEXAS COAST WILDCATS

Brazoria County: Seaboard of Delaware's John L. Jones 1, 1400 fr s&wl 885-ac lse, 4606.6 fr sl 1400 fr wl Oliver Hall sur, 3½ mi sw Manval prod, abnd 3-22-47 at 8731.

Montgomery County: Superior's Agnes Risher et al 1, 1000 fr nl 660 fr wl 300-ac lse, Denward James sur, 2½ mi se nw Conroe prod, 1½ mi w of Conroe, abnd 3-30-47 at 10,501.

The OIL WEEKLY'S TRADING POST

CLASSIFIED ADS — SERVICES - PERSONNEL USED EQUIPMENT

Rates: Regular classified (undisplayed) set in this size type: 7 cents per word for first insertion and 5 cents per word for each succeeding insertion of same copy. Displayed advertisements, set in suitably larger type with ruled border, $5 per inch for first insertion and $4 per inch for succeeding insertions same copy. **All classified ads payable in advance.** Send copy and checks to: Trading Post Section, The Oil Weekly, P. O. Box 2608, Houston, Texas.

FOR SALE

■ FOR SALE—Well service unit Diamond T truck with "H" Cardwell unit and mast—8RKR. Waukesha motor with tubing and rod tools. Excellent condition. Also one Ideco 5060 super unit with mast. Also excellent condition. The Cavins Corp., 3408 McKinney, Houston, Texas.

■ 5 Complete Reda Pumping Units. Cables like new, 75 and 97 H.P. Motors. Max Steinbachel, 1905 Park Place, Wichita 4, Kansas. Phone 5-6082.

BOILER TRUCK—Best equipped boiler truck in Houston area. Chevrolet, new engine, new tires; flue scaler and cut-off. New C. P. Compressor, Lincoln and Victor Welding Equipment, Air Motors, Grinders, Drills, Impact Wrenches, Rivet Buster, Taps, Rolls, Superheater Tools—every air tool a boiler maker could want. Ready to go—no junk. Also $4,000.00 stock tubes and staybolts.

JIMMIE DOBKINS
P. O. Box 7365 Phone T-7931
Houston 8, Texas.

FOR SALE
Steel Storages Tanks

7—72,600 barrel capacity
Now on Our Tank Farm near
Morgantown, W. V.

South Penn Oil Co.
Parkersburg, W. Va.

For Sale—Immediate Delivery

DIESEL ENGINES

2—Winton Model 1920 3 cyl 10" x 14" 94 HP @ 300 RPM
3—Winton Model 1290 3 cyl 12½"x16" 120 HP @ 250 RPM
9—Winton Model 1580 3 cyl 14" x 16" 170 HP @ 270 RPM
1—Busch 3DF17 3 cyl 13" x 17" 175 HP @ 300 RPM
2—DeLavergne 4 cyl 14½"x13" 250 HP @ 270 RPM

PUMPS, HORIZONTAL DUPLEX RECIPROCATING

24—Prescott 6"x24" capy. 20,000 bbls. per day 800#
13—Prescott 4⅝"x18" 9,000 bbls. per day 800#

GENERATORS, DIRECT CURRENT

21—Allis Chalmers 25 KW 125 Volt Belt Driven
2—Westinghouse 25 KW 125 Volt Belt Driven
9—Allis Chalmers 15KW 125 Volt Direct Connected to Model CSR6 gasoline engine

COMPRESSORS, AIR

8—Ingersoll-Rand, Type 20, two stage, 5"&2½"x4", with 7½ HP Allis Chalmers direct current motors

Also water circulating and sump pumps, direct current motors and motor starters ½ to 7½ HP, switch boards and other items.

H. F. SWINDLE, Purchasing Agent
Great Lakes Pipe Line Company
Kansas City 13, Missouri
P.O. Box 2239 Phone Grand 2160

FOR SALE

■ New 3" 125# WP Plug Valves, 8thd; also 4" 90° LR Std Weld Ells. Priced reasonable. Box 879, Houston 1, Texas.

■ 2—Complete Mobile Casing Pulling and Swabbing Rigs for sale—Double acting hydraulic jacks and automatic break out tongs, Wilson Mfg. Co. equipment including 10,000# hydraulic pump. Call or write Oil Field Services, Inc., 625 Baronne Street, New Orleans, L. Tel. CA 2280.

■ 32'x10'x3'-6" draft—New all steel work and crew boat. Controls inside. Capable carrying 16 men in cabin. Large deck space forward and aft of cabin. 130 HP Kermath, 18 Mph. Guaranteed. Ideal for large lakes, rivers and swamps. TECHE STEEL WORKS, INC., New Iberia, Louisiana.

■ Lumber for Sale: 3x6 and wider 10 to 16 rough oak $58.00. E. J. Gaiennie Lumber, Box 1074, Shreveport, Louisiana.

FOR SALE

1—Bucyrus-Erie 36-L with casing strut, Butane equipped, Waukesha engine, 5500' ¾ drilling line, 3500' 9/16 sand line, 1000 gal. Butane tank, water tank, 5000 Watt Kohlar light plant, 7'x10' wood dog house on steel skids with all hand tools, drilling tools 15½" down to 5" forge and other big hole equipment.
1—Bucyrus - Erie 36 - L, Gas-Gasoline Buda Motor, 5500' ¾" drilling, 5500' 9/16" sand line, water tank, 5000 Watt Kohlar light plant, 7'x10' wood dog house on steel skids with hand tools, forge, 4", 5" and 6" drilling tools.

DEMIER DRILLING COMPANY
219 West Church. Salem, Illinois.

1 H-46 Emsco Steam Drawworks—7500' Drilling $600.00
1 12x12 Gumbo Buster Steam Engine 500.00
1 20½" Gumbo Buster Rotary 250.00
1 66" 4-sheave Ideal Travelling Block 150.00
1 12x6x16 Wilson-Snyder Steam Pump 400.00

All in usable condition. Direct inquiries to Mr. Booker, Danciger Oil & Refining Company, Baton Rouge, Louisiana, Phone 2-2685.

WANTED TO BUY

■ Wanted to Purchase: A used Schmidt type vertical intensity field magnetometer in good condition. Address Box 20 c/o The Oil Weekly, Houston, Texas.

ATTENTION PRODUCERS AND BROKERS: I am interested in buying production for my own account. Must be good stuff and must pass the scrutiny of recognized petroleum engineers.

J. L. STONE,
Box 548, Phone No. 6 San Juan, Texas.

SITUATIONS WANTED

■ GAS ENGINEER, mechanical graduate, desires connection with San Antonio firm. Experienced in plant design and construction, and machinery, valves and piping sales. Address: Box 26, c/o The Oil Weekly, Houston, Texas.

HELP WANTED

ARCHITECTURAL DRAFTSMAN AND STRUCTURAL DRAFTSMAN—Experience in the design and construction of service stations and oil bulk plants preferred. Major petroleum company in Chicago. Give complete details first letter. Address: Box 27, c/o The Oil Weekly, Houston, Texas.

Major oil company has good opportunity for experienced Seismic Computer. College graduate preferred; central location. Please give age, education, experience and status of availability in first letter. Address: Box 19, c/o The Oil Weekly, Houston, Texas.

Full Program Announced For Oil Compact Session

Expanded use of the nation's oil and gas resources and methods to induce their greater development and utilization will feature the Interstate Oil Compact Commission's spring quarterly meeting in Birmingham, Ala., April 24-26.

Governor Beauford H. Jester of Texas will discuss the effect of conservation on oil and gas development. Experiment in underground gasification of coal, being carried on by the Alabama Power Company at Gorgas, Ala., will be discussed by Dr. Milton H. Fies, consulting engineer in charge of the project. A session will be devoted to the Federal Power Commission's staff reports in its natural gas investigation. Nelson Lee Smith, FPC chairman, and Harrington Wimberly, FPC member, will attend.

The economics advisory committee is to meet two days prior to the general session. All other Compact committees will meet during the morning of April 24.

HELP WANTED

■ WANTED: Graduate engineer with at least ten years practical operating experience in refinery of less than 20,000 barrels capacity. Must have excellent scholastic and business experience; good health, under 45 years old. Prefer graduate chemical engineer, who is practical, conservative and energetic. Strong personality with native ability to handle men required. Good, permanent position open with strong and reputable company in South Texas refinery. Replies will be held in strict confidence. Address: Box 24, c/o The Oil Weekly, Houston, Texas.

WANTED: Party experienced in "Gas-Lift" to manufacture and service well advertised product. It has been on the market for 25 years and is now in steady demand.

Address: Box 28 c/o The Oil Weekly Houston, Texas

LEASES, DRILLING, ACREAGE, ETC.

■ FLORIDA ACREAGE—Large tracts cut-over and young timber land for sale in fee. Box 2191, Orlando, Florida.

■ JOHN O. BANKS pays top prices for producing royalties, 302 Gilbert Bldg., Beaumont, Texas.

OIL and GAS LEASES FOR SALE

In Lea, Eddy, Otero, Chaves, Roosevelt, DeBaca, and Curry Counties, New Mexico.

ALSO PRODUCING WELLS FOR SALE located in Loco Hills and Turkey Track Areas, Eddy County, New Mexico.

Write for exact locations and other information—Robert E. McKee, General Contractor, P. O. Box 562, El Paso, Texas.

"Best Bet Yet"

Here's a compact Sucker Rod Wiper designed as Well Pullers wanted it. Short overall height, 4", just right height for wrenching rods. Weight complete, only 29#. Easy to handle, comes mounted on pony rod ready to be used. Tough, natural rubber wiping webs squeegee rod, box and square free of oil. No oil leaves hole or flips on crew... Rubbers stand enough pressure to take oil to tank or sump if well flows. Wipes any size rod, ⅝" to 1¼".

Duo-Wipe style, code: SUBZONE, shown above, has two wiping elements. Quadra-Wipe Style, code: SUBSOLAR, has four rubbers for use with extra-low gravity oil. Both styles make up on standard tubing sizes at the well head.

Cut-away drawing shows sturdy construction. Handy Table Plate Head, available for both models, holds rod tools and elevators.

Write for Catolog No. 310

Specify
PATTERSON-BALLAGH
A DIVISION OF BYRON JACKSON CO.
"Best Bet Yet"

SUCKER ROD WIPERS

1900 E. 65th Street, Los Angeles 1
6247 Navigation Boulevard, Houston 11
808 Graybar Building, New York 17
931 Russ Bldg., San Francisco 4

SQUEAKS from the BULL WHEEL

Not Iced, Though

A drunk on a train noticed a woman nursing a very fat baby. "Lady, what do you feed that baby to make it so fat?"

"Milk and tomato juice."

He meditated a moment, looked the situation over, licked his lips, and inquired: "Lady, which one is the tomato juice?"

Lazy Lad

"Buy a postcard for a dime, mister?"

"Certainly, my little man. And what are you ging to do with the money?"

"I'm raising a million dollars for the Red Cross."

"What! All by yourself?"

"Oh, no, sir. There's another little boy helping me."

Hints for Householders

The doorbell rang one Sunday morning and he hurriedly slipped on his wife's robe and opened the door. The ice man rushed in and gave him a resounding kiss. At first he was puzzled, but by and by he decided that the ice man's wife must have a similar robe.

Famous Last Words

Just before she stepped into her bath that morning, the lady of the house mounted the scales. As she peered hopefully down at the wavering needle, her husband came in through the kitchen and paused at the door of the bathroom. "How many pounds today, beautiful?"

"Fifty, sweetheart. And be darn sure you don't leave those ice tongs on the back porch where the neighbors can see 'em."

Ad Production Hints

To remind us that they get things done in strange and wondrous ways out in California, Horace C. Dickey of Oildale sends in a clipping from a newspaper want ad section:

WANTED—Set of used Hi Speed 14-inch bowels for deep well pump. Phone 3-3024.

The Crusher

A much-married Hollywood actor was confronted by a very boring damsel. "Don't you remember me?" she gushed. "Ten years ago you asked me to marry you."

"Really?" he yawned. "And did you?"

This Curious World

Some women wear slacks to show their independence. And some wear them to show other things.

Sign on the marquee of a theater: "Double Feature. One Heavenly Night. Between Two Women."

He shipped two rabbits from coast to coast by air express. The crate arrived with two rabbits. Which is fast transportation.

"No girdles, no liquor," she sighed. "How do they expect a gal to stay tight?"

She laughed when I sat down to play. How did I know she was ticklish.

When a woman goes on a drastic diet, she has one or both of two objectives in mind—to retain her girlish figure or her boyish husband.

Poet's Nook

I've a husband who is rich,
He really brightens my life.
He buys me all I crave—
But don't tell his wife!

Just In Time

The Scotchman awoke one morning to find his wife had died. He leaped from the bed and dashed screaming to the kitchen. "Cook! Cook! Have you started breakfast yet?"

"No, sir."

"Praise be! Just boil one egg for breakfast.

Life Is Like This

"The young man lounging in the back of the room!" blared the professor. "What was the date of the signing of the Declaration of Independence?"

"Me? Oh, I dunno."

"Let's try another question. Who was Tom Paine?"

"You still talking to me? I dunno."

"Can you tell me the date the UNO was formed?"

"Dunno."

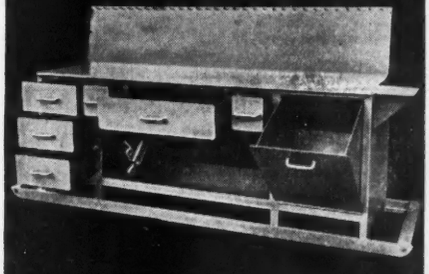
"Well, well. I assigned these questions last Thursday. What were you doing last night?"

"That's one I can answer. I was out drinking beer with the boys."

"What! How do you expect to pass this term?"

"I dunno, bud. I just come to fix the steam pipes."

OWEN



Type "A" Work Benches

Keep Tools Where You Need Them—When You Need Them

Yes sir, these benches will really pay off when you're in a bind and need a wrench in a hurry. They keep all hand tools within quick, easy reach and prevent misplacement, damage or loss.

Made of heavy steel plate, they're all-welded for strength and drawers are roller mounted for easy operation. There's plenty of storage space for hand tools, grease guns, rags, etc.

Buy one for each of your rigs... they'll save time, tools and tempers.

Sold Through All Supply Stores

California Distributor: Howard Supply Co., Los Angeles

OWEN TOOL COMPANY
ROUTE 9 BOX 400-B V-2-4341
HOUSTON, TEXAS

W. Frank Matheny, manager of the gasoline division of Phillips Petroleum Company, Bartlesville, Okla., has resigned to join Richardson & Bass, Inc., Fort Worth, to supervise the construction and operation of the latter's natural gasoline plant in the Keystone field, West Texas. He had been with Phillips 23 years, and as head of the natural gas division had direct supervision of plants, natural gas and gasoline lines.

»

Leroy Vaden has joined The Texas Company's North Texas scouting staff at Wichita Falls, succeeding **Joe J. Fasey,** who has rejoined the Army.

»

Joseph L. Martin, president of Wichita River Oil Company, Delaware corporation with headquarters in the Chrysler Building, New York City, and capitalized at $500,000, has received permit for the firm to operate in Texas. Operating office has been located in the City National Bank Building, Wichita Falls.

»

Lawrence G. Grunder, Richfield Oil Corporation; **J. A. Beattie,** Standard Oil Company of California; and **Homer Reed,** Union Oil Company, are members of a committee of scientific and technical men appointed by the Los Angeles Chamber of Commerce to work for smog elimination.

Dr. Charles N. Gould, founder of the University of Oklahoma School of Geology, will retire soon after serving geologists and the petroleum industry for 47 years. Credited with discovering the Panhandle gas field, which he first surveyed in 1903, Gould located the first well in the Amarillo structure, which was completed for a gasser. His other discoveries include the South Bend field in Texas; Poteau, Carter-Knox and Muskogee fields in Oklahoma, and the Augusta field in Kansas. He will move to Florida.

»

W. H. (Bill) Esser of Shell Oil Company has been named president of Oklahoma Petroleum Motor Transport Association; and **C. E. Jackson,** Mid-Continent Petroleum Corporation, was chosen secretary-treasurer; **G. L. Wheatley,** Cities Service Oil Company, second vice president; and **C. J. Martin,** Phillips Petroleum Company, first vice president. Directors elected include **J. W. Rayborn,** Tide Water Associated Oil Company; **H. J. Chambers,** Oklahoma Natural Gas Company; and **Del Clark,** Stanolind Pipe Line Company.

»

Joe A. Humphrey and **Layton Humphrey** have incorporated the Nueces Oil Corporation with capital stock of $10,000 to acquire producing properties in South Texas. Headquarters are at Dallas.

F. M. Boykin, Jr., and **H. C. Traxler** of Taft and **H. M. Ansler** of Houston have incorporated the Midway Gas Company to operate in Texas, with headquarters at Taft. The firm is capitalized at $15,000.

»

Tom Graham, J. A. Kimmey and **W. J. Blackman** have organized the Jim Wells Gas Company to operate in Texas with headquarters in Corpus Christi.

»

Sid W. Richardson and **Amon G. Carter,** Fort Worth oil men, have enlarged their Fort Worth business property holdings in acquiring the Commercial Standard 17-story building, which is largely occupied by oil firms.

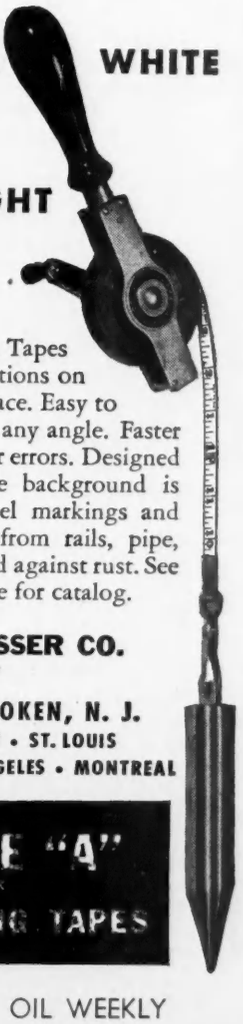
»

Ritchie R. Ward, associate personnel director of the Emeryville (Calif.) laboratories of Shell Development Company, has been appointed assistant manager.

»

M. M. Luther, Tulsa, has been elected to the board of directors of Stanolind Oil Purchasing Company, succeeding **Henry Waters,** resigned, **George C. Getgood** was appointed assistant secretary, to have supervision of the division order and contract department. **P. M. Broach** was named chief scout; **J. C. Mytinger,** assistant chief scout; **R. W. Boyd,** chief accountant; **T. E. Martin,** assistant chief accountant; **K. H. Klein,** administrative assistant, and **W. A. Kirkpatrick,** supervisor of the coordinating department.

BLACK on WHITE for BETTER SIGHT



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- **External and internal diameters are the same as in regular tool joints.**
- **Packers prevent escape or entrance of fluids.**
- **It does not interfere with drilling, fishing or testing procedures.**
- **It will not release or back-off except at the will of the operator.**
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W. E. Stephenson has been promoted to district manager of the North Central Texas district of Bethlehem Supply Company, with headquarters at Wichita Falls, Texas. Stephenson has had six years' experience in the oil field supply business, having been employed by Bridgeport Machine Works and Bovaird Supply Company prior to his affiliation with Bethlehem. He served as chief specialist in the Navy for three years during the war and has been with Bethlehem since December, 1945.

W. E. Stephenson

»

Chester L. Crotts has been appointed sales representative for the Big Four Machine & Supply Company of Clay City, Ill. Crotts served throughout World War II as navigator on photo reconnaissance with 15 months service in the C-B-I Theatre. He will make his headquarters at Flora, Ill.

»

Frank Stice, W. M. Lawson and **E. E. Sanders,** all of Beeville, Texas, have incorporated the Stice Production Company, with capital stock of $10,000.

S. C. Dunn and **W. L. Dunn** of Amarillo and **A. E. Monroe** of Pampa have organized the D. & M. Drilling Company, Inc., to operate in Texas, with headquarters at Pampa. The firm is capitalized at $60,000.

»

Richard B. Shults has been appointed Texas manager of the N. H. Drilling Company, Oklahoma City firm recently given a permit to operate in Texas, with capital stock of $100,000. Shults has offices in the First National Bank Building, Dallas.

»

Amos D. Moss, director of purchases for The B. F. Goodrich Company since 1920 and a member of the organization since 1899, will retire July 1. He will be succeeded by **E. A. Stevens,** assistant to the director of purchases since April, 1942, and with the company since 1928.

»

A. D. Robertson, formerly assistant manager of sales and engineering of the electrical section at the Norwood (Ohio) Works of the Allis-Chalmers Mfg. Company, has been named manager of the Tampa, Fla., district office, succeeding the late **Berrien Moore.** Robertson joined Allis-Chalmers in 1938 and in 1939 was transferred to the Washington, D. C. district office as sales engineer. In 1940 he was placed in charge of the marine motor and generator sales section at West Allis, Wis. He was named to his Norwood post in 1944.

Fred S. Dewel has been named Rocky Mountain Agent for Larkin Packer Company, Inc. Formerly associated with Shell Oil Company and Bovaird Supply Company in Kansas, Dewel has been a manufacturers' agent for nine years. He attended Oklahoma A. & M. He is a member of the American Petroleum Institute.

Fred S. Dewel

»

M. F. Caver has joined Thigpen Laboratories at Shreveport. He is a petroleum engineer and was previously connected with Core Laboratories at Houston.

Deaths

E. P. Jarvis of Jarvis Brothers and Marcell Oil Company, Decatur, Ill., died in Peoria, Ill., April 2. He was identified with the discovery and development of the deep Spider field in De Soto Parish; North Louisiana.

»

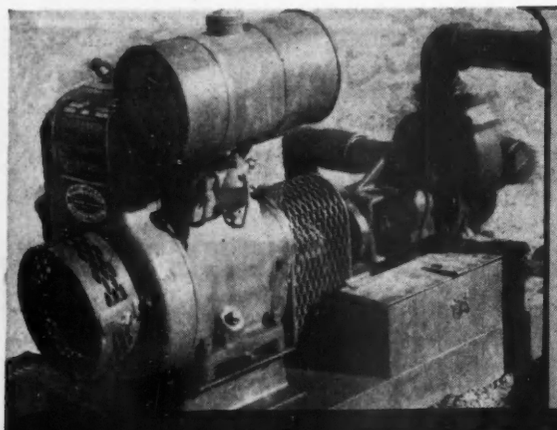
Harry C. Beaver, 71, vice chairman of the board of directors and formerly president of Worthington Pump & Machinery Corporation, Harrison, N. J., died in New York April 2. Born in McAllisterville, Penn., he attended Marquette University Law School and his first business post was with the Pennsylvania Railroad. He subsequently was with Westinghouse Electric Manufacturing Company; Allis-Chalmers Manufacturing Company, with which he attained the position of general manager of the Norwood, Ohio, Electrical Works; Stevens-Duryea Company as vice president; and then with Rolls-Royce of America, with which he was vice president. He joined Worthington in February, 1931, as a vice president and was elected president in September, 1931, a position he held until December, 1944, when he was named vice chairman of the board of directors.

»

Frank Sutton, 81, vice president and secretary of Belridge Oil Company, Los Angeles, and identified with the oil industry in California for nearly 40 years, died April 7 after a two-day illness. He went to California in 1908 and joined a group of companies operated by oil men **Max Whittier** and **Burton Green.** He has been identified with Belridge since its organization in 1911. He was also vice president and secretary of Rodeo Land and Water Company and Burton E. Green Investment Company.

»

Moses Ellis, 72, retired oil operator, was found dead in his home at Tulsa April 5. He had resided in Oklahoma a number of years and at one time was active in various Oklahoma fields.



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This pumping unit built by Harley Sales Company is a typical example of a little engine doing a big job. Powered by a Model AK Wisconsin Heavy-Duty Air-Cooled Engine, this dynamic little unit pumps 65 barrels of oil per hour in the newly developed oil field in Cotton County, Oklahoma.

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Edgar F. Schaefer Becomes New President of Gardner-Denver Firm

Edgar F. Schaefer, executive vice president of Gardner-Denver Company, was elected company president, and H. G. Myers, former president, became chairman of the executive board at the annual stockholders' meeting at Quincy, Ill.

Edgar F. Schaefer

In assuming chairmanship of the executive committee, Myers takes the post formerly held by the late J. W. Gardner. Myers joined the firm in 1927 as chief engineer. In 1929 he made executive vice president and in 1935 was elected president, succeeding W. H. Leonard, who became chairman of the board of directors, the post he still holds.

Schaefer joined Gardner-Denver Company in 1919. He was elected vice president in 1926, and became executive vice president in 1942.

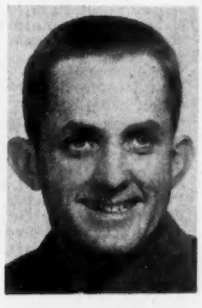
Unit Rig & Equipment Company Of Tulsa Sold for $1,106,000

The Unit Rig & Equipment Company, Tulsa, manufacturer of drilling equipment, has been acquired by Unit Rig & Equipment Company, a Delaware corporation, at a sale price of $806,000, plus assumption of a $300,000 bank note, or a total of $1,106,000.

The sale was conducted in Tulsa district court by Judge Horace D. Ballaine. The firm went into receivership last year after the death of one of the partners, J. R. Underwood.

Successful bidder was William Guier, president of the firm that made the purchase. R. E. Carter is vice president and S. O. Morton secretary-treasurer.

Ira Wells



Rex Galloup

Oil Center Tool Representatives Named for West Texas, Oklahoma

Oil Center Tool Company, Houston, has announced the appointment of Rex Galloup as West Texas sales representative. Galloup served Orbit Valve Company in a similar capacity for several years before joining the Oil Center sales staff. His headquarters are at Midland.

Ira Wells, veteran OCT sales representative in the West Texas area, has been transferred to the Oklahoma District as sales representative.

FWD Consolidates Advertising and Sales Promotion Departments

Consolidation of the FWD sales promotion department and advertising department under the managership of M. O. Stockland, Jr., was announced by The Four Wheel Drive Auto Company. Stockland has served as sales promotion manager since the organization of that department early in 1946.

M. O. Stockland, Jr.

The consolidation move came as a result of the retirement of Francis M. Higgins as advertising manager to devote all his time to his work as president of Wisconsin Central Airlines.

Stockland has been connected with The Four Wheel Drive Auto Company since 1922 and has been located at the home office in Clintonville since 1936.

Johns-Manville Buys Properties Of Goetze Gasket & Packing Firm

Purchase of the factories and other properties of Goetze Gasket & Packing Company, Inc., New Brunswick, N. J., manufacturers of metallic gaskets, by Johns-Manville, was announced by Lewis H. Brown, chairman of the board of Johns-Manville Corporation.

By the terms of the purchase, Johns-Manville acquires the factories and other physical properties and the going business of the Goetze company. Goetze gaskets will be produced as formerly, at the Goetze plant in New Brunswick and sold by Johns-Manville under the Goetze name.

The Goetze plant in New Brunswick contains 40,000 square feet of floor space, and has manufactured gaskets ranging from ⅛ inch in diameter, weighing a fraction of an ounce, to 34 feet in diameter and weighing 1500 pounds.

Bowen Celebrates 25th Anniversary; Long-Time Employes Are Honored

President J. A. Wilcox, Treasurer S. Siracusa and A. G. Baumbach received special recognition at S. R. Bowen Company's 25th anniversary dinner at which long-time employes were honored.

Founded by S. R. Bowen in 1921, the company branched out from Huntington Beach, Calif., to Long Beach, Santa Fe Springs, where a new manufacturing plant is now nearing completion, Bakersfield, Ventura, Avenal, Santa Maria and Casper, Wyo. Foreign offices are maintained in New York City.

Rollway Opens Office

Rollway Bearing Company, Syracuse, N. Y., has opened a sales office in the Renshaw Building, Pittsburgh, with John R. Bell in charge. Bell has been a sales representative in the Syracuse office for several years. He will take over his new assignment April 15.

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Continental's Key Men Meet

Key men of The Continental Supply Company's Arkansas-North Louisiana, Mississippi and East Texas Districts met at Shreveport recently. Also present were F. I. Brinegar, vice president; D. D. Dellinger, treasurer; and J. A. Mussler, manager of tubular sales.

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